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AND

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R. & G. S. WOOD.

1 Jan., 1845.

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THE

MEDICO-CHIRURGICAL REVIEW.

JANUARY, 1845.

MEDICO-CHIRURGICAL TRANSACTIONS, PUBLISHED BY THE ROYAL MEDICAL AND CHIRURGICAL SOCIETY OF LONDON. Volume the Twenty-seventh (the Ninth of the Second Series), 1844.

IN the present dearth of medical works of sterling merit and original views, the appearance of the annual volume of the Royal Medical and Chirurgical Society is an event of some importance in medical literature. There have been few men of eminence in the profession in the present century who have not been contributors to these transactions. Those long established in practice have enriched the pages of this work with the results of their matured views of disease, and with the curiosities of their medical experience, whilst the young and enterprising have made them a record of original inquiries and interesting observations in the ample field of pathological science. It must be confessed that the novelty of the volume, though not its substantial value, is in some degree lessened by the authorized publication in the weekly periodicals of an abstract of the papers read at the Society's meetings, and even of papers of which the titles only had been announced, owing to the press of communications sent in at the close of the season. For this reason, we think that the publication of the present volume should not have been delayed to so late a period as the month of November. The papers are communicated to the Society in a state ready for the press, and the task of selection—of winnowing the grain from the chaff, may be said to commence at the beginning of the session. We are aware of one alleged cause of delay, viz. the time occupied in colouring the plates. They are, however, too few in number (only three) to account for the late period at which the volume has this year been delivered to the members. We are glad, however, to see some coloured illustrations. Pathological appearances cannot always be satisfactorily represented by plain lithographs, and the Society is sufficiently prosperous to afford the additional expense of colouring them. The present number is thicker than any of the later volumes, having no less than five hundred pages, and as usual contains many valuable communications to which we shall now direct the attention of our readers.*

* The Council have done well in placing round the Meeting-room the busts of

1. An Account of Two Cases of Rupture of the Ureter, or Pelvis of the Kidney, from External Violence, followed by large Effusion of Urine into the Abdomen. By *Edward Stanley*, F.R.S.

Cases of rupture of the urinary bladder by external violence are by no means of rare occurrence, and as the laceration usually involves that portion of the viscus which is invested with serous membrane, the urine escapes into the sac of the peritoneum and gives rise to fatal peritonitis. But the pelves of the kidneys and the ureters are differently situated, so that a rupture of their walls would only permit the escape of the secretion of the kidneys into the surrounding cellular tissue, where we can easily understand that actions might be set up to limit the diffusion of the fluid and to avert the dangerous consequences of the injury. It may also be observed, that these parts are by their position well protected from injuries, and being channels for the transmission of the urine, and not organs for its retention, they are less liable to be ruptured by external violence than a distended urinary bladder, which sufficiently explains the rarity of the accident described by the President in the two interesting cases which he has communicated to the Society.

A boy, aged 9 years, was brought to St. Bartholomew's Hospital, having been squeezed between the wheel of a cart and a curb-stone.

"The immediate consequences were, severe contusion of the soft parts around the pelvis, inability to walk, and great pain in the lower part of the abdomen; he lay helpless, apparently suffering from severe internal injury. Much ecchymosis ensued in the integuments around the pelvis, and extensive suppuration in the subcutaneous cellular tissue, from which several ounces of matter were discharged by puncture near the left sacro-iliac symphysis. By the end of the sixth week, recovery of the injured soft parts around the pelvis had considerably advanced. At this period, my attention was directed to a fulness not before observed on the right side of the abdomen, and on further examination, a circumscribed, oblong swelling was recognised through the abdominal parietes, extending from the base of the chest downwards to within a short distance of Poupart's ligament; anteriorly, it terminated abruptly at the linea alba; posteriorly, it could be traced into the lumbar region, but it here presented no distinct boundary; the liver appeared to be pressed upwards by the swelling, so that the right lung did not extend below the sixth rib, the admission of air into it here ceasing in a defined line. Pressure on the swelling gave no pain, but a deep fluctuation in it could be recognised. The urine passed naturally, as it had done throughout, and that there was no distention of the bladder was ascertained by the introduction of a catheter. I could but suppose the swelling to be an abscess, but there was difficulty in adopting this opinion of it from the absence of pain and constitutional derangement. To discover the nature of the swelling, I made a small puncture in it with a lancet, from which a little clear yellow fluid escaped; this was followed by much pain in the abdomen, which yielded to the application of leeches. By this exploratory proceeding, I learned that the fluid was situated immediately beneath the abdominal muscles, and that it was not pus. Three

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some of the more distinguished Members and former Presidents of the Society. They form elegant and appropriate ornaments to the walls, and Halford, Cline, Babington, Cooper, Abernethy, Travers, Earle and Brodie have well deserved the honour awarded them.

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weeks afterwards, the abdominal swelling having become more tense and pointed, I punctured it with a small trochar midway between the last rib and crista of the ilium, and discharged from the opening fifty-one ounces of a clear yellow fluid. Pain in the abdomen followed this puncture, but it yielded as before to the application of leeches. Eleven days afterwards, the swelling having again enlarged, I discharged from it by puncture fifty-eight ounces of a clear yellow fluid. In sixteen days from this puncture, the swelling having again greatly increased, I removed from it sixty-four ounces of fluid. The swelling returned, and having acquired a certain size, it remained stationary, on which account it was not interfered with for nearly three months, when I again punctured it, and discharged seventy-two ounces of fluid of the same characters as before. Three weeks afterwards, I punctured the swelling the sixth and last time, but discharged only six ounces of fluid, and it appeared to me that a larger quantity was not obtained from the existence of some obstacle to the canula fairly entering the cavity in which the fluid was contained. The other parts of the treatment consisted in the repeated application of leeches, in the application, on one occasion, of a large blister to the swelling, and in the use for a considerable time of the ointment of iodide of potassium: but, with the exception of the leeches, which relieved the pain in the abdomen recurring more or less after each puncture, it is doubtful whether the other measures were of any service. Throughout, the general health had been good, and all the functions of the body appeared to be perfectly performed. From this period the swelling continued without increase or obvious diminution: it still extended from the linea alba into the right lumbar region, and as any further interference by operation or otherwise, was now considered inexpedient, I discharged the boy from the hospital nine months after the occurrence of the accident. At several subsequent periods I have seen him in good health, with the abdominal swelling still distinct, but, as we have thought, slowly diminishing, and with less evident fluctuation." 5.

Mr. Stanley remarks that three questions of interest here arise—what was the nature of the fluid so largely accumulated in the abdomen; where was it situated; and, if it was urine, from what part of the urinary apparatus was it derived? The first question is answered by the chemical examination of the fluid evacuated made by Mr. Edward Ormerod and Mr. Taylor, who detected, in addition to a large quantity of urea, the other ordinary ingredients of urine. Mr. Taylor further observed, that from the absence of mucus in the fluid, the probable source was high in the urinary apparatus, as at the commencement of the ureter. With respect to the situation of the fluid, Mr. Stanley discusses the question, whether it was lodged within the peritoneal sac, or had formed for itself a cavity by detaching the peritoneum from the abdominal and lumbar muscles, and from the circumscribed character of the swelling, and especially its abrupt termination at the linea alba, where its further progress would be impeded by the firm connection of the peritoneum with the abdominal aponeuroses, as well as from the absence of peritoneal inflammation, and the formation of the tumour without pain or constitutional derangement, we think justly concludes the latter to be the situation where the fluid had accumulated.

The second case also occurred in St. Bartholomew's Hospital, under the care of Mr. Vincent. A woman was admitted immediately after having been knocked down, and, as it was stated, pushed some way before the wheel of a cart. The left femur was broken and she was much hurt in the left hypochondrium. On the following day there was much febrile disorder, and severe pain and distention of the abdomen. After bleeding

from the arm, the application of leeches to the abdomen, and the administration of calomel and antimony, the general distention and pain subsided, but there remained a circumscribed and painful swelling in the right hypochondrium. It increased and formed a fluctuating tumour, which was supposed to be an abscess probably connected with the liver. Mr. Vincent punctured the swelling with a small trocar and discharged between two and three pints of a straw-coloured urinous-smelling fluid. The patient was much relieved; but in about ten days the fluid had again accumulated so as to occasion much distress. Six pints of a similar fluid were again removed, with temporary relief. But the swelling returned and she gradually sunk and died in the tenth week from the receipt of the injury. The fluid obtained from the abdomen was found to be albuminous, and to contain a small quantity of urea.

"Upon examination of the body, a large cyst was found on the right side of the abdomen behind the peritoneum extending upwards to the diaphragm, and downwards to the pelvis. The boundaries of this cyst were formed by lymph and thickened cellular tissue; within it was a large quantity of fluid presenting the characters of a mixture of pus and fetid urine. A passage was found extending from the upper part of the cyst into the pelvis of the right kidney. The aperture in the pelvis of the kidney was large and irregular; the appearances were such as might be expected to result from laceration of the membranous structure composing it. The liver presented in its anterior border, the marks of a slight laceration of its tissue, which was in progress of healing. The kidneys were slightly granular." 10.

Mr. Stanley notices a circumstance exhibited by these cases which may be of importance in practice, viz. the absence of any symptom of immediate occurrence leading to a suspicion of injury to any part of the urinary apparatus, and concludes by suggesting the question, whether the best proceeding would be gradually to withdraw the fluid by repeated punctures of the cyst, and thus to favour the collapse and adhesion of its sides upon the plan recommended by Mr. Abernethy for the treatment of lumbar abscess, or whether the urinary cyst should be punctured at its lowest part, in the view of maintaining the aperture free for some time, that the fluid may drain from it, upon the plan which has been adopted in cases of empyema for the discharge of fluid from the chest. We should be inclined to give the preference to the plan adopted by Mr. Stanley and Mr. Vincent in these cases, because we conceive that a large cyst containing urine mixed with morbid secretions would, if left with an open communication, be as liable to inflame and to give rise to severe constitutional derangement and hectic symptoms as the cyst of a large lumbar abscess.

II. ACCOUNT OF A CASE OF CYSTICERCUS CELLULOSÆ OF THE BRAIN. By *Drewry Ottley*, Esq.

This is a form of hydatid which sometimes occurs in large numbers in the brain, especially of persons dying at an advanced age. Cruveilhier observed in the brain of an epileptic patient who died in the Bicêtre at Paris at least a hundred of these parasites. Some were seated in the subarachnoid cellular tissue of the brain and cerebellum; others occupied the

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substance of the convolutions and central part of the hemispheres, and as many as fifty were detected in the structure of the cerebellum. In the case related by Mr. Ottley we have a better account of the disorder of the cerebral functions produced by these bodies than has generally been given by those pathologists who have discovered them. The patient was the wife of a chimney-sweeper about forty years of age. Cerebral symptoms first appeared in the early part of 1838, and chiefly consisted of frequent giddiness, dull pain in the head, loss of memory and confusion of intellect. In 1839 she became subject to fits, during which there was entire loss of consciousness, with convulsions of the limbs.

"The character of these attacks was different from that of ordinary epileptic fits; they were less sudden, both in their invasion and their termination, and the convulsions ceased and recurred as often as eight or ten times in as many hours, the stupor remaining during the intervals, and after their cessation. The recovery from them was slower also, for she would often remain for two or three days in a stupified state, with difficulty roused to understand a question, and incapable of replying to it, sometimes using wrong words, at others unable to pronounce the words she wished to employ.

"During the last twelve months of her life, her sufferings became more constant. She could not venture to walk alone, for she would stagger as she went, or suddenly become so confused as not to know in what street she was walking; and more than once she was attacked with a fit in the streets. The pain in the head was now constant, though never *extremely* acute; her sight became dim; the convulsive attacks recurred more frequently; and, at length, towards the end of October, 1840, after being frightfully convulsed for twenty-four hours, with the face twisted over the right shoulder, and the pulse becoming more frequent and feeble, she expired, without having had any return of consciousness." 14.

On examination of the body,

"The vessels on the surface of the brain were found moderately congested, and the sub-arachnoid cellular tissue was infiltrated with serum; but the most remarkable morbid appearance which the organ exhibited arose from the presence of numerous small fibrous cysts in the pia mater, covering the surface of the hemispheres, and dipping between the convolutions of the brain. These cysts were present on both sides, but were most numerous on the surface of the left hemisphere. They varied in size from that of a pea to that of a small peppercorn: they were seated in the pia mater, but had become partially imbedded in the gray matter of the convolutions. None existed in the white matter, in the central ganglia, nor in the plexus choroïdes. A few were found at the under surface of the cerebral convolutions; but none either in the cerebellum or medulla oblongata. The cerebral tissue around the cysts appeared natural, as to colour and consistence; and the brain generally, except for the presence of these animals, would have been termed healthy. There was, I should add, however, rather more fluid in the ventricles, and at the base of the brain, than is natural."

The cysts were found to contain vesicular entozoa, presenting all the characters of the cysticercus cellulosæ. In some of the cysts the animal had evidently perished, and was undergoing decay.

III. On the Cause of the Occasional Presence of Spermatozoa in the Fluid drawn from the Sac of common Hydrocele of the Tunica Vaginalis. By *John Dalrymple*, Esq.

We were disappointed on reading this paper by so able a pathologist as

the author, to find that it adds no new fact, and throws no new light on the subject of the presence of spermatozoa in the sac of the tunica vaginalis.

Mr. Dalrymple gives some extracts from the writings of Scarpa on the altered relative position of the vessels of the spermatic cord in scrotal hernia and in hydrocele, which we differ from him in believing to be known to all well-informed surgeons, and he adds the particulars of a dissection of the parts in a common hydrocele to illustrate some anatomical points, which scarcely needed further confirmation. Mr. Dalrymple's object is to show that the epididymis and vas deferens are placed by no means out of danger of being punctured by the trocar, and that the wounding of a seminal tube might afford the few spermatozoa occasionally found in common hydrocele; but in the solitary case upon which his observations are founded, no spermatozoa were discovered in the sac of the tunica vaginalis, nor does it appear that either the epididymis or vas deferens had been wounded with the trocar; and the probability of the supposition as to the source of these bodies adopted by the author, is lessened by the fact that they have been found after death in a tunica vaginalis which had never been submitted to an operation. In consequence of the vas deferens and epididymis being displaced towards the external part of the sac in cases of hydrocele, Mr. Dalrymple is of opinion—

"That the position at which the trochar should be entered, ought to be made much more towards the mesial line than is usually adopted, and that the antero-lateral or antero-external aspect should in future be avoided, unless after the most careful and accurate examination the true position of the parts should be determined." 24.

The displacement is not in general of sufficient extent to render this caution necessary, and we believe that the rules commonly given for the performance of the operation of tapping a hydrocele may continue to be safely acted upon.

The next paper is not in the order of succession, but relates to the same subject as the preceding one.

IV. AN ACCOUNT OF THE EXAMINATION OF A CYST CONTAINING SEMINAL FLUID. By *James Paget*, F.R.C.S.

The author, believing that the presence of spermatozoa in the fluids of certain hydroceles has not yet been illustrated by examinations after death, contributes the following observations:—

"A middle-aged man was admitted into St. Bartholomew's Hospital, under Mr. Stanley, six months ago, with what was regarded a common hydrocele of the tunica vaginalis on the left side. This was tapped, and several ounces of a serous fluid, of the kind usually found in such hydroceles, were drawn off. The fluid was not particularly examined; the hydrocele was not injected; and soon after, the man left the hospital. He returned with the hydrocele again full; and besides, with very extensive abscesses in the perineum and fistulous openings into the urethra and bladder. With these he died, extremely emaciated, on Wednesday, June 5th; and the parts connected with the hydrocele were removed for examination.

"The sac which had been tapped, and which, in its external appearance, even after its removal from the body, had all the characters of a common hydrocele, was found to be completely separate, and its cavity distinct from that of the tunica vaginalis. It was situated just above the testicle, and in front of the spermatic cord; it was of an elongated oval form, four inches in length, and held about six ounces of a bright light-yellow fluid, containing a small quantity of albumen, but no trace of either spermatozoa or any other organic particles. Its walls were very thin, and loosely connected with the adjacent parts; they were composed of well-organized delicate fibro-cellular tissue, and their internal surface was smooth, but not lined by any epithelium. The sac was closed on every side: it was separated from the tunica vaginalis by tissue like that of false membrane, layers of which formed several incomplete cysts, or spaces, containing a serous fluid like that in the sac itself." 399.

The tunica vaginalis appeared healthy and contained three drachms of fluid similar to that in the sac, and also destitute of any trace of spermatozoa or any other constituent of the semen.

"By the upper part of the epididymis, on its inner side, and attached to its surface, where on each side the tunica vaginalis is reflected from it, there was a globular cyst, about two-thirds of an inch in diameter, completely distinct from those already described, though almost surrounded by them. Its walls were thin, but opaque white; they were composed of fibro-cellular tissue, with delicate pale filaments, intricately interwoven, and not so fully organized as that of the large sac. From its polished inner surface I scraped scales of an exceedingly delicate tessellated epithelium, composed of very pale, elongated, oval, and angular cells, united by their obscure edges, and having dark large nuclei of the same shape as themselves: they were much like the epithelium-cells of the tunica vaginalis itself, but even smaller than those of the blood-vessels. The contents of the cyst were two or three drachms of an opaque whitish fluid, in which there were numerous spermatozoa, dead and small, but well formed, and still more numerous granules, and large round granular spermatic globules. It contained no albumen coagulable by heat.

"This cyst was closed on every side, and loosely connected to the adjacent parts, so that without cutting, and with very little force, it could be easily separated from them. The part of the surface of the epididymis to which it was attached was left, after its separation, perfectly smooth, and without the least appearance of a breach in the investing membrane, beneath which the fine convolutions of the seminal duct were seen, uninjured and undisturbed. It was as evident as it could be that the cavity of the cyst was completely isolated from every part of the seminal tubes." 401.

These cysts appear to correspond with those serous sacs minutely described by Mr. Curling in his recent work on the Testis, under the head of Encysted Hydrocele of the Epididymis, and stated to be of very common occurrence. Mr. Paget remarks:—

"If, with the aid of these observations, we endeavour to find an explanation of the occurrence of spermatozoa in the fluid of cysts connected with the testicle, we may suppose either that the fluid part of the semen has permeated from the seminal tubes into the cysts, and been further organized in them; or, that the cyst itself secretes a fluid in which the organic structures of the semen may be developed. Such a permeation is hardly possible; for the fluid would have to pass not only through the vascular wall of the tubes, but through two or three more layers of vascular tissue, by all of which it would be absorbed rather than transmitted. The most probable explanation of these cases, therefore, seems to be, that certain cysts, seated near the organ which naturally secretes the materials for semen, may possess a power of secreting a similar fluid. And this explanation is in some mea-

sure supported by the analogy of those cysts which are found in the ovaries, and more rarely in other parts of the body, especially beneath hairy parts of the skin, and in which the ordinary products of the skin, such as epidermis, sebaceous matter, hair, &c., are formed on the genuine cutaneous tissue of their internal surface." 402.

Mr. Paget's explanation of the vicarious appearance of the spermatozoa, which has of late so much puzzled the members of the Society, has the merit of being ingenious and original, though it must be added that we are by no means satisfied with it. There is considerable doubt whether one secreting organ, or part, can completely perform the offices of another of different structure, or wherefore the necessity for the variety of tissue and complicated arrangement of the glands, and it must be observed that the spermatozoa found in some of the recorded cases of hydrocele have appeared as perfect and as well developed as any taken from the vas deferens or vesiculæ seminales. The cause of the presence of these bodies in the different forms of hydrocele still requires further investigation.

V. CASES OF CARCINOMA OF THE THYROID GLAND. By *Cæsar Hawkins*, Esq.

This is a disease generally regarded by writers as of rare occurrence, but Mr. Hawkins is inclined to believe that the thyroid gland may be more often the seat of primary scirrhus than is usually supposed. He first gives the case of an old man who was admitted into St. George's Hospital on account of a large and hard tumour occupying the whole of the anterior part of the neck, and impeding respiration, which Mr. Hawkins conjectures, and perhaps rightly, to be a case of the disease alluded to; but the patient subsequently left the hospital to go into the country and was lost sight of. In the second case the history is complete.

"Thomas Holder, æt. 50, was admitted into St. George's Hospital May 17th, 1843, having the appearance of perfect health, with a considerable enlargement of the whole thyroid gland, but particularly of the right lobe, which projected upwards more than the left; the tumour was uniformly smooth on the surface, and very firm and solid; it was completely fixed to the larynx, and sufficiently free from attachment to other parts to move with all the motions of the larynx and œsophagus; the skin was unattached and unaltered in colour, and the superficial veins were large. He breathed with some noise, and had a slight cough, but could respire naturally when told to do so. Deglutition was performed with somewhat more difficulty than respiration, although the larynx and trachea were thrown very much to the left side of the neck, nearly two inches perhaps out of the central line. The tumour was free from pain and tenderness. The patient was deaf and dumb, so that a full history could not be obtained at first; but it was learned that the first appearance of the tumour was only about five weeks before his admission." 29.

The nature of the tumour was concluded to be carcinomatous, and the case was treated with iodide of potassium, which was employed both internally and locally, but without benefit. The tumour increased in size, and on the 13th of July was perhaps half as large again as on his admission. He became considerably emaciated, and died on the 23d. He suffered severely from dysphagia, which prevented any solid food from

being taken, and even liquids were swallowed with difficulty, so that he frequently was obliged to lean on the table from threatened suffocation in the act of eating, and from vomiting, which sometimes occurred regularly at a certain period after eating, and at other times took place violently during his meal. He also suffered much from pain in the epigastrium and hypochondria, and had tenderness over the stomach, while the respiration seemed little interfered with. About the middle of July, the pain being then much increased, he began to vomit some coagula of blood, but this again lessened while he was taking some lead and opium. For a few hours before death he had much difficulty of breathing. The following is an account of the *post mortem* examination.

"Upon the interior surface of the windpipe was a large tumour, which extended from the thyroid cartilage to the sternum. Laterally it projected beyond the sterno-mastoid muscles, the fibres of which, as well as those of the sterno-hyoid, omo-hyoid, and sterno-thyroid muscles of both sides, were expanded over, and partly imbedded in the tumour. The right internal jugular vein, common carotid artery, and pneumogastric nerve, were separated from each other by the pressure of the morbid growth. The vein was closely adherent to the tumour, and its coats, in one place, had been absorbed, and a soft part of the tumour projected into its interior, and a large clot of blood was firmly attached at this part. The artery was deeply imbedded in the tumour, and the pneumogastric nerve much flattened, and its fibrils separated so as to present a plexiform appearance.

"The thyroid gland had nearly disappeared, the only part which was left being a small portion of the left lobe intimately joined to the tumour, so as to show that they were originally portions of the same body, and this portion that remained was perfectly natural, and there was a complete line of demarcation between the two structures. The anterior surface of the windpipe was healthy.

"Posteriorly the morbid growth had extended to the pharynx and œsophagus, and to the cellular tissue connecting them with the larynx and trachea. The posterior part of the œsophagus was healthy, but the anterior part presented a large, irregular, ulcerated mass, extending from the arytæno-epiglottic ligaments to the first three or four rings of the trachea, and projecting into the interior of the pharynx and œsophagus, its surface being of a dark green colour, and covered with shreds and portions of sloughs, which were very fetid. The larynx and trachea had been quite pushed over to the left side, forming a curved line, and the right arytæno-epiglottic ligament was much thickened and altered in texture, and immediately below the cricoid cartilage a large ulcerated opening led into the trachea.

"Externally, the tumour presented an irregular lobulated appearance, the greater part being situated on the right side; internally, it presented the structure of genuine scirrhus; it was remarkably firm, in some places of a light yellow colour, and in others of a pale red tinge; the variety of scirrhus which it most resembled being the solanoid form; in fact, the section was very like that of a red potato.

"There were many small encephaloid tubercles at the base of both lungs, and in the cellular tissue under the costal pleura.

"The brain was wet, and the bloody puncta large, and the veins and sinuses were gorged with dark-coloured blood.

"The stomach was perfectly healthy, and rather small; the liver healthy, with a small serous cyst on the surface of the right lobe; the other viscera were healthy." 33.

Mr. Hawkins makes some sensible remarks upon the symptoms of this very interesting case.

"The symptoms enumerated, as caused by this tumour, included tenderness and pain in the epigastrium, vomiting after meals, and latterly hæmatemesis,

which naturally led my attention to the stomach. During the first few weeks, careful examination detecting no hardness or swelling, and the symptoms not being constantly present, I did not think there was cancer of that organ; but during the last few days, the repeated vomiting of blood, and the great pain and tenderness of the epigastrium, and in that region only, made me express an opinion that there was most probably cancer of the stomach. The difficulty of swallowing, and the vomiting of blood were, however, satisfactorily accounted for by the ulceration and sloughing of the œsophagus and pharynx; but whence arose the marked pain and tenderness exactly over the stomach; which were more complained of by the patient than any other symptom, and existed even at the times when there was a temporary cessation of nausea?

"Looking to the highly-expanded state of the fibres of the right pneumogastric nerve, is it not very probable that the symptoms in question depended upon this circumstance, the pain being referred (as with pressure on the spinal nerves) to the part where the nerves are finally distributed below the seat of pressure and irritation, which would in this case be chiefly the pyloric end of the stomach?

"I think I never saw the larynx so much turned out of its natural course by any tumour, as in this case, and dissection showed us also a cancerous degeneration of the side of the rima glottidis, and an ulcerated opening into the trachea; but yet the difficulty of respiration was never urgent till just before his death, and cough was very little complained of throughout the whole illness. He could always expand the chest freely, and without pain, and the stethoscopic signs showed only bronchitic effusion at the times that the obstruction about the glottis was more marked than usual. In fact, where there has been no pleuritic effusion, and no scirrhous alteration of the pleura, the little distress occasioned by encephaloid tubercles scattered through the parenchyma of the lungs is often very remarkable." 35.

The paper is concluded by some observations on the comparative frequency of scirrhus and encephaloid disease of the thyroid gland. The following is an appendix to the foregoing paper.

CASE OF SCIRRHUS OF THE THYROID GLAND. By *R. Wilson Brown*, Esq.

Mr. G——, aged 60, of active habits and previous good health, began, in December, 1842, to suffer from uneasiness about the larynx and slight cough and hoarseness, all of which symptoms became aggravated before Christmas. "A hard swelling presented itself in the situation of the left lobe of the thyroid gland. The swelling was not prominent nor well-defined externally, but appeared to extend internally, and press upon the œsophagus, causing great uneasiness, and great difficulty of deglutition. Mr. G. remarked that his throat seemed to be bound, as it were, with an iron hoop. The integuments in the neighbourhood became thickly studded with hard tubercles of a cancerous character.

"Internally the disease continued to make progress, the difficulty of deglutition increased, the cough became more violent, convulsive, and almost incessant, with copious muco-purulent expectoration, streaked with scarlet blood."

He died in June, 1843, after much suffering. The body was examined thirty-eight hours after death.

"The emaciation was very considerable. Numerous hard tubercles were seated in the skin, covering the throat and part of the chest and abdomen. The

seat of the principal disease was in the left lobe of the thyroid gland, which was somewhat enlarged, and converted into a mass of carcinomatous structure, white, hard as cartilage, and with some gritty particles dispersed through it. The chain of lymphatic glands in the neighbourhood, on both sides, had undergone a similar change, and by these the œsophagus was compressed and reduced in diameter, and the larynx so firmly fixed in its situation, as to prevent any change of its position.

"There was not any ulceration of the inner surface of the œsophagus, nor any communication between it and the trachea. There was some thickening of the epiglottis, but not any disease of the trachea." 39.

Hard carcinomatous tubercles were also found in the lungs, and liver, in the glands surrounding the stomach, and in the skin on the surface of the chest and abdomen.

So few cases of carcinoma originating in the thyroid gland are on record, that these cases are valuable additions to the history of cancer. The disease is not likely to be mistaken for ordinary bronchocele, which is a complaint of early life, whereas carcinoma is usually developed in persons somewhat advanced in age, according to Mr. Hawkins, from the period of forty-five to sixty-five. The tumour too is harder, and has a more irregular surface than a bronchocele, and also makes more rapid progress. Mr. Hawkins states that in the scirrhous tumour the motion of the larynx is itself interfered with, and therefore it not only rises less freely, but respiration and deglutition of the patient are more affected than with most other tumours even when of much larger size. A large bronchocele may, however, seriously interfere with both these functions, so as even to cause death, but such extreme cases are very rare in this country. When the swelling extends laterally, these distressing symptoms are partly occasioned by the restraint of the sterno-cleido mastoideus muscle.

VI. Alarming Syncope, from the Admission of Air into a Vein during an Amputation at the Shoulder Joint. By *Bransby B. Cooper*, F.R.S.

Eliz. Cousins, æt. 19, was admitted into Guy's Hospital for malignant disease of the right humerus. Mr. Cooper came to the conclusion that the only chance of saving life was by amputating the limb at the shoulder-joint. On the 23d of May, the operation was performed by making a double flap, the subclavian artery being commanded by presure upon the first rib: it occupied less than a minute; there was no loss of blood, and the patient bore it with great fortitude.

"The subclavian artery was immediately secured; but compression was still retained upon the first rib as there were small vessels requiring ligature. I then proceeded to remove a gland from the axilla, which was somewhat enlarged, and while dissecting it from its cellular attachments, I distinctly heard a peculiar gurgling noise, like air escaping with fluid from a narrow-necked bottle, and at the same instant the patient fell into a state of collapse, threatening immediate dissolution: the countenance was deadly pale, the pupils fixed, and inobedient to light; the pulse quite small and fluttering, although at intervals regular; the respiration hurried and feeble, and, at irregular intervals, attended with a deep sigh. The patient was directly placed in the horizontal posture, the flap covered over the wound, and retained by plaister. Cold water was dashed over her face,

ammonia held to the nostrils, and a sponge filled with wine applied to the lips but an hour elapsed before she was sufficiently recovered to be removed from the Operating Theatre.

"Upon being placed in bed, she passed her fæces and urine involuntarily;—some wine and camphor julep, with half a drachm of laudanum, were given to her. During the reaction coming on, she uttered a continual whining cry, and maintained a constant motion of alternate flexion and extension of the right leg while the left remained perfectly quiescent. She continually complained of pain extending up the right side of the head and neck. Her feet being cold, warm bottles were applied, and twenty drops of liq. opii sedativus given. At four o'clock the wound was dressed, when some small vessels were secured, and a nerve liberated which had been included in one of the ligatures: and to which, perhaps, the pain in the neck and head might be partly attributed. The edges of the wound were brought together and maintained in apposition by silk sutures and adhesive plaister. Twenty drops of laudanum were ordered: to be repeated if necessary.

"Wednesday, eight o'clock, a. m.—When she awoke, all the symptoms were much relieved; pulse 150, small, irregular, and compressible. Tongue moist and white; profuse perspiration over the whole body—keeps her eyes constantly closed.

"Two, p. m.—The symptoms much the same as in the morning; still continual action in the right leg, with apparent loss of motion in the left. Pulse 140, feeble—seems inclined to doze, but answers perfectly coherently when spoken to—pupils still somewhat dilated—tongue moist—diaphoresis not so profuse. Beef-tea and arrowroot with wine ordered for her, when she desired it, as she takes nourishment freely.

"Eight, a. m., Thursday.—Has had a better night; dozing, but waking up at intervals with a whining cry—continues to keep her eyes constantly closed—diaphoresis less—pulse 140—still irregular and feeble—tongue moist—bowels have not been opened since the operation, but she voids her urine freely—action of the right leg continues; the left still motionless.

"On the 26th the stump was dressed—pus of an unhealthy character exuded from the wound, which, however, at the upper part had united for two inches.

"Her state was variable for the following six or seven days; the nights were restless, and there were occasional febrile exacerbations. The action of the right leg continued, and, on one occasion, there were involuntary flexions of the left, which she had not the power of extending.

"Opium was given freely with much relief, and she was allowed a nourishing diet.

"On June 3d, she was much better, and from that time rapidly improved. Tonics and support of every kind were freely exhibited; the stump continued progressively to heal; and on the 20th day after the operation, the ligature came away from the axillary artery.

"On the 25th day she was able to sit up in a chair and take her dinner. Complains of great numbness and loss of power in the left leg, which she drags after her; but it is as sensitive as the right, and while lying in bed, if pinched, she forcibly draws it up. On the 3d of July, she was sufficiently recovered to leave the hospital, having no other unfavourable symptom than a slight dragging of the left leg." 46.

This patient was re-admitted into the hospital the latter end of November, 1843, for a tumour of the left scapula, of a similar morbid structure to that in the right arm. This tumour increased and destroyed life, by encroaching on the right side of the chest and on the spine, producing paraplegia. She died at the end of January, 1844.

This is a very satisfactory case of recovery from the alarming syncope

consequent upon the accidental introduction of air into a large vein during an operation. The occurrence, though fortunately very rare, is one which the operating surgeon should be prepared to encounter, and to treat with energetic remedies. Mr. Cooper has appended to the above case a brief account of the results of the inquiries made by a Commission, instituted by the Royal Academy of Medicine, to investigate the circumstances of this accident. The author states that, the attention of surgeons was first invited to this subject by M. Beauchêne, but at what date he omits to mention, and adds in a note, "it seems, however, that the fact of an injurious influence from the admission of air into the veins was known to Morgagni as long back as 1517, but had been forgotten, notwithstanding he has related a case." The date must be a misprint probably for 1715, since Morgagni wrote in the eighteenth century, not in the sixteenth. The statement is nevertheless interesting, but would have been more satisfactory if a reference had been given to the authority upon which it is made.

VII. ACCOUNT OF A HORN DEVELOPED FROM THE HUMAN SKIN; WITH OBSERVATIONS ON THE PATHOLOGY OF CERTAIN DISORDERS OF THE SEBACEOUS GLANDS. By *Erasmus Wilson*, Esq.

Mr. Wilson commences this paper by a description of the mode of production of the sebaceous secretion and its microscopic appearances. He remarks:—

> "The sebaceous substance is secreted from the blood, through the agency of the cells which compose the epithelial lining of the gland, as is the case probably with all the secretions of the body; but there is this difference between the sebaceous and other secretions, namely, that the former is semi-solid, while the rest are fluid; the solidity or density of the sebaceous matter being due to the great number of empty and more or less distended cells which compose its mass." 53.

The quantity of this matter varies in different individuals as to its density and apparent composition, and its cells undergo changes in accordance with the state of health of the skin, or of the individual, and perhaps also in conformity with the chemical constitution of the blood. Mr. Wilson alludes to two of these changes, one which occurs in molluscum contagiosum, a disease consisting in the development upon the skin of small sebaceous tumours in variable numbers. In this affection the tumour results from the solidity of the contents of the cells of the sebaceous secretion, the solidity being so great as to preserve the form of the distended cells, and consequently to dilate the follicle with the ducts of the sebaceous glands. There is besides, a deficiency of oil globules and of albuminous fluid, and consequently the impacted substance is dense and dry. The contents of the cells in this disease are chiefly coagulated albumen in a granular form. The second modification in the constituents of the sebaceous cells is that which was described by Mr. Dalrymple in the last volume of the Society's Transactions. In this case the sebaceous cells were flattened, having the ordinary appearance of epi-

thelial scales, and containing phosphate and carbonate of lime in their interior. The author next alludes to another pathological state consequent on imperfect secretion of the sebaceous substance, in which, from the torpid action of the skin, or from the nature of the contents of the cells, or from both causes acting together, the sebaceous substance collects within the follicle, becomes impacted, and acquires an abnormal degree of density.

"In this situation the impacted mass exerts so great an amount of pressure on the vascular walls of the follicle, as to abrogate its special function, and the peculiar elements of the sebaceous secretion cease to be produced. The formation of epithelium, however, still continues, and layer after layer of epithelial scales are developed, until the mass acquires considerable size. Tumours of this kind, from the nature of the position of the sebaceous follicle, namely, within the corium, rarely acquire a large size as compared with tumours in other situations. They are prevented from pressing inwards by the deep stratum of the corium; the same structure opposes their increase outwardly or laterally. Nevertheless, I have seen a tumour of this kind which measured three-quarters of an inch in diameter, but not more than a quarter of an inch in thickness. The aperture of the follicle remains open, and is more or less distended in proportion to the extent of the tumour; but from the nature of the collection, there is no tendency to its escape. I have called such tumours *sebaceous accumulations*. Certain minute tumours, commonly met with in clusters around and upon the eyelids, *sebaceous miliary tubercles*, are of the same pathological nature with the sebaceous accumulations, but in these the excretory follicle is closed.

"The peculiar pathological character of the tumours just described is their laminated texture, and the identity of structure of their contents with epidermis, most, if not all, of the peculiar constituents of sebaceous substance being absent."

"If now, in the cases above recited, we imagine the upper wall of the laminated tumour to be removed, and the accumulated substance exposed to the influence of the atmosphere, any moisture retained by the epithelial laminæ would soon become dissipated, and the whole mass would acquire the consistence and hardness of epidermis of equal thickness; in other words, it would be converted into horn.

"Such a case as that which I am now supposing does sometimes in reality occur. The aperture of the follicle acquires an unusual degree of dilatation, and some of the hardened contents of the tumour are pressed through the opening. By the addition of fresh layers from below, (the formative power having increased by the removal of superficial pressure,) the indurated mass is still further forced outwards, dilating the aperture as with a wedge, and finally increasing its size to that of the entire base of the hypertrophied follicle. The process of formation of new epithelial layers by the walls of the follicle (now become the base of the mass) will go on, unless interrupted by surgical means, for years, and in this manner those singular bodies, of which so many remarkable examples are on record, *horns*, are produced." 59.

Mr. Wilson relates a well-marked example of horn in a female servant fifty-seven years of age. At the age of five-and-twenty, "she observed a small elevation, like a pimple, on the site of the present growth; the pimple increased in size, was somewhat painful, and in about ten years from its first appearance burst, and discharged a quantity of matter resembling 'mashed potatoe.' From this moment a cavity always remained, from the bottom of which some 'scurfy' matter could be raised by the finger nail. At the beginning of the current year the present growth made its appearance in the situation of the cavity, and increasing in size, gave

her much pain and uneasiness. The skin around it was red and inflamed, and she applied a poultice, which had the effect, according to her, of making it grow still faster. During the summer she suffered much from the frequent jerks which the growth received from her dress, and from awkward blows which it sustained, and in the month of October she applied to her master for relief. At this period the growth had acquired a considerable size: it was situated on the upper and front part of the thigh, and presented the appearance and characters of horn. It was semi-transparent, yellowish in colour, dense and horny in texture, ribbed on the surface, insensible to the pressure of the nail, and firmly rooted in the skin. In general appearance it resembled the broad and curved beak of a bird, of large size, and had a broad and extensive base. Around the base, the integument arose to the height of several lines, and in two places to fully half-an-inch. The skin was thin and attenuated as though from the effects of stretching, the epidermis being continuous with the surface of the horn, and gave the idea of a degeneration of the integument into the horny structure."

Mr. Wilson removed the horn by cutting through the integument round its base, and dissecting it from the subcutaneous tissue. The sore healed slowly, but was closed by the fifth week. On examining the horn after removal, the author "found its base to be formed by the deep stratum of the corium, so that it was obviously a cutaneous formation. The base was oval in shape, and measured in its long diameter one inch and a half, and in the opposite direction one inch and a quarter. The horn was two inches and three-quarters in length, by two inches in greatest breadth, and its elevation above the surface was one inch and a quarter. The latter measurement was that of the vertical thickness of the horn; for in consequence of its mode of growth, its long diameter lay parallel with the surface of the skin. The sebaceous accumulation must originally have formed a prominent tumour, from the side of which the protrusion took place; the thin integument covering the other half still retaining its elevation from distention. Traces of this mode of formation are still apparent upon the surface of the horn. Subsequently, the thin integument has become inflamed and ulcerated, and, receiving no granulations from beneath, has desiccated upon its horny contents. This ulceration was the cause of the redness and pain of which the patient complained, and its extent is marked upon the horn, by a rough discoloured surface of a circular figure, surrounded for more than two-thirds of its extent by a margin of thinned integument. The weight of the horn was six drachms.

"The section of the growth presents all the characters of horn; it is laminated longitudinally, the laminæ being distinctly traced by their difference of tint from the base to the apex of the horn. At the apex, moreover, it is split in the direction of its laminæ, and several external lamellæ are partly separated from those beneath."

This description is followed by an account of the minute structure and size of the epithelial cells of which the horn is composed, to which we must refer those of our readers who are interested in the subject. Horny growths from the skin do not appear to be so uncommon as is generally believed. Mr. Wilson has collected ninety cases, of which forty-four were females, and thirty-nine males; of the remainder the sex is not men-

tioned. Forty-eight were seated on the head, four on the face, four on the nose, eleven on the thigh, three on the leg and foot, six on the back, five on the glans penis, and nine on the trunk of the body. Old age appears to be a predisposing cause of this affection, as is shown by the greater frequency of its occurrence in elderly persons. The author refers to some remarkable cases of human horn on record. Amongst others, he mentions the case of a Mexican porter, who had a horn upon the upper and lateral part of the head, which was fourteen inches in circumference around its shaft, and it divided above this point into three branches. Sir E. Home saw two cases, in both of which the growth measured five inches by one inch in diameter. They were curled, and had the appearance of isinglass. In one case the horn was fourteen years growing. A horn in the British Museum is said to measure eleven inches in length by two and a half in circumference. The paper is concluded by a reference to the principal writers who have paid attention to the subject of these growths.

Mr. Wilson is known to have devoted a good deal of attention to the investigation of the diseases of the skin, and it is only justice to him to add, that in the observations which we have just brought under the notice of our readers, the development of horn from the skin is satisfactorily explained, and its structure ably described, and that the paper affords evidence of considerable research.

VIII. On the Early Organization of Coagula and mixed Fibrinous Effusions, under certain Conditions of the System. By *John Dalrymple*, Esq.

In the 23d volume of the Society's Transactions, Mr. Dalrymple has described the case of a seaman who died of scurvy on board the Dreadnought hospital ship. One of the legs of this man having been injected by Mr. Busk, it was found on examination that a large coagulum of blood extravasated beneath the periosteum of the tibia was minutely injected. This specimen was adduced in order to show the rapidity of the organization of the fibrinous materials of the blood, in certain cachectic conditions of the system. In Mr. Travers' recent work on inflammation, that gentleman expresses a doubt as to the character of the effusion in the case referred to by Mr. Dalrymple, and inclines to the belief, that the injected mass was rather a fibrinous effusion mixed with the colouring principle of the blood, than a true extravasation, and that the injected canals were the original vessels between the periosteum and the bone, stretched and separated by the effused fibrin. It appears that Mr. Busk also conceived that the specimen consisted, in part at least, of effused fibrin, but he maintains the new formation of the injected vessels. The object of the present paper is to confirm the fact stated in the former one, and to meet the objections of Mr. Travers by further and more satisfactory observations. A Lascar died of scurvy on board the Dreadnought, in whose knee-joint were found many coagula, some adherent to the reflected synovial membrane surrounding the cartilages of the femur and tibia, and some loose in the cavity of the joint. The limb having been very successfully injected, the attached coagula were found to be permeated with new and numerous capillary

vessels. In the former case, the fact of the organization rested solely upon the perfection of the injection, the absence of any extravasation of of the vermilion, and the form and peculiarity of type of the new vessels. In this more recent case, Mr. Dalrymple, instead of relying solely upon the fact of the clot having been injected, proceeded to a microscopical examination of the morbid parts.

"The coagula presented the appearance of dark but firm clots, and upon being viewed beneath the microscope, their colour was found to depend upon an infinity of red blood disks in an entire state, mingled with fibrinous globules. The firmness of the masses, however, was due to the advancing organization of the fibrin itself, the fibrinous cells being found in all stages, from the granulated sphere to the caudated cell, ultimately developing into filamentous tissue.

"There were—

"1. The exudation or fibrinous corpuscules, spheroidal and granular.

"2 Nucleated cells—oval with eccentric nuclei and nucleoli.

"3. Cells elongating in one direction and becoming caudate.

"4. Cells more elongated, and the tails occasionally bifid.

"5 Cells drawn out into a filamentous prolongation at either end. And,

"Finally, their conversion into simple wavy filaments.

"At first the cells were filled with granular matter, as well as with their large nuclei; but as they increased and became elongated, the nuclei diminished, and the granular matter was less abundant: at length the nuclei nearly disappeared, and the filaments became clear. It should be added, that all these varieties of cell-development were seen in one and the same preparation, and at the same time.

"It was to the interlacement of these caudate cells and filaments, that the firmness and definite outline of the coagula were due; and this description exhibits the true progressive organization of the living germs, which *precedes*, as I believe, the formation of new vessels.

"In corroboration of this last remark, I may observe the curious fact, that in the loose coagula found in this same joint, there were not only present those appearances, described by Mr. Gulliver, as due to the simple coagulation of blood out of the vessels, viz. its fibrilation intermixed with blood disks and fibrinous globules, but a distinct stage in advance, or an attempt at progressive organization, although the coagula were loose in the joint, and unattached to any living tissue.

"Even here, a few caudate cells were found, intermingled with coagulated and fibrilated blood, enough, however, to show that the law of vitality impressed upon the cell germs was in action, after all direct connection with living tissue had ceased, and when it is obvious no new vessel could have been formed within the mass. This is a point that requires extended observation, and may have some connection with the obscure subject of the production of loose cartilages, sometimes found in joints and bursal cavities." 73.

Pathologists, accustomed to microscopical inquiries, after reading this description, will entertain but little question, but that the fibrin submitted to examination was in a state of progressive organization; and if, as there appears no reason to doubt, the coagula were really effused blood, Mr. Dalrymple may be said to have established the important fact which he formerly affirmed. It is not, however, now contended, nor was it in his former paper, *that ordinary extravasations of blood in the healthy body* become organized, because, he observes, the vitality of surrounding parts is higher than that of the blood so effused, and the absorbents, under

such conditions, effect their ordinary changes in consequence of a tendency to disintegration, rather than to an advanced development of the effused blood.

IX. Case of Extirpation of an Ovarian Cyst terminating fatally. By *Bransby B. Cooper*, F.R.S.

As full details of several cases, in which enlarged ovarian cysts have been extirpated, have been published within the last few years, it will be sufficient to give a brief account of this case, and of a similar one which forms the subject of the next paper; and the remarks which they naturally suggest may be reserved, till we come to consider the observations of Mr. Phillips on the recorded cases of this operation. The patient was a healthy-looking woman, æt. 32, who, though married, had never been pregnant. An abdominal enlargement was first noticed about five years ago, but she could not discover on which side it commenced. Eleven months afterwards she was admitted into Guy's Hospital "to have the tumour extracted, which, however, was not performed, as the operation was unsuccessful in a case at that time in the hospital. She consequently went out, and a month afterwards married, but at the expiration of six months her general health became so much impaired from the rapid accumulation of fluid, that she applied to me to perform paracentesis abdominis; but a day or two before her admission into the hospital for the purpose, having taken, by the advice of a friend, a glass of gin, she passed a gallon of urine during the night, and the increased flow continued for ten days afterwards, although in diminished quantities; so that at the end of that period no vestige could be discovered of the original tumour. Many months, however, had not elapsed before her abdomen again enlarged, and continued to do so for eighteen months, when she again passed a large quantity of urine, and the swelling was a second time dispersed, but not so completely as on the former occasion. Twenty months after this last favourable event, the tumour having acquired its original bulk, paracentesis abdominis was performed, and three gallons of a straw-coloured fluid were drawn off. She recovered from this operation without a bad symptom. Seven months ago she was again tapped, an interval of thirteen months having elapsed between the two operations. On this occasion she likewise convalesced without anything untoward having occurred; but the fluid was of a darker colour, and thicker. It does not appear that she has ever had symptoms which would induce the belief that she had suffered from peritonitis, so as to cause any adhesions."

The abdomen to the right, is stated to have been larger than at the full period of utero-gestation, and of an oval form, and on passing the hand over it, an irregular mass, of the size of a saucer, was felt midway between the enciform cartilage and umbilicus, composed probably of compound cells. Over every part of the abdomen there was dulness on percussion, and more than usually distinct fluctuation.

The state of the general health appeared to be good, and Dr. Blundell, who saw the patient, gave it as his opinion, that the case was a favourable

one for the removal of the tumour. The operation was therefore decided upon.

The temperature of the room having been raised to F. 72°, and the patient placed in a convenient position, "an incision was made below the umbilicus, in the median line, between three and four inches in length; and the peritoneal cavity being opened to a small extent, a little ascitic fluid escaped. The finger was introduced, and passed around the opening, and a few slight adhesions broken down. An incision was now made through the integuments, commencing three inches below the ensiform cartilage, and extending to the upper part of the first incision, carefully avoiding the umbilicus; and the sub-cutaneous structures were then divided by a probe-pointed bistoury, cutting from below upwards, the finger being used as a director. The wound was also enlarged towards the pubis. Very trifling hæmorrhage ensued; and the tumour, now clearly exposed, slowly and steadily advanced, its substance being supported very carefully by Mr. Law, whilst Dr. Noyes kept the integuments in close contact with it posteriorly, in order to avoid unnecessary exposure of the intestines, or other viscera. A broad and thin pedicle, connected with the right ovary, was now fairly brought into view, and a strong needle fixed in a handle, and armed with double silk, was passed through its centre, and both ligatures being securely tied, it was divided between the ligature and cyst, and the mass removed. Dr. Cape having examined the remaining ovary, and pronounced it healthy, the wound was closed by about fifteen interrupted sutures; and strips of adhesive plaister being applied, and the roller adjusted, she was removed to bed.

"The patient bore the operation with uncommon fortitude, but there being some slight attempt to vomit during the application of the sutures, half a drachm of Battley's solution, in camphor-water, was given. Pulse before the operation, 87; after removal to bed, 96."

She appeared to be going on well till the second day after the operation, when symptoms of peritonitis occurred. It assumed an asthenic character, and terminated fatally on the seventh day. The cyst is stated to have been a collection of compound cells, which weighed 32lbs., but the description given of it is very imperfect. On examination of the body, the intestines were found coated and glued together with lymph, and in the interspaces formed by the adhesions there was a small quantity of purulent fluid. About an ounce of blood was observed in the right iliac fossa, probably effused from the divided vessels of the peduncle. The uterus was large, tumid, and of a dark colour; anteriorly, and at its superior part, there was a soft fungoid tubercle, of the size of a walnut. This was examined under the microscope by Mr. Reynolds, and pronounced to be highly malignant. A small piece of omentum, adherent to the peduncle, was enclosed in the ligature.

The age and health of the patient, and condition of the tumour, were favourable for the operation. The only untoward circumstance was the disease in the uterus, which could not have been ascertained beforehand.

X. CASE OF THE REMOVAL OF A DISEASED OVARIUM, TERMINATING FATALLY ON THE SEVENTH DAY AFTER THE OPERATION. By *T. M. Greenhow*, Esq.

Mary Nicholson, æt. 29, had enjoyed good health till her marriage two years ago, except that, for about two years previously, she had frequent uterine discharge of blood. Shortly after marriage the discharge returned, and about six months afterwards she first felt a swelling in the pubic region, which extended to the right side, and in a short time a moveable tumour, about the size of an orange, could be distinguished. The swelling from this time rapidly enlarged, and was attended with almost constant uterine discharge, under which her strength gave way. She had once been tapped, but little else than blood in moderate quantity was removed, and, since the operation, no uterine discharge has taken place. At present her strength is much increased, and she has no symptoms of constitutional disorder. "The abdomen is about as large as at the full period of utero-gestation; fluctuation in one or two situations; but generally the tumour is firm, and feels as if divided into two separate masses. She has no pain or tenderness in any part of abdomen, except at one point towards the right iliac region, were the original moveable swelling was first felt. No alteration in the os, or cervix uteri, can be discovered, and, as far as can be ascertained by examination *per vaginam*, the organ is in a natural condition."

The operation was performed on September 3d, at 11, A. M. The temperature of the room having been raised to 76°.

"The incision reached from a little below the ensiform cartilage to near the pubis. The peritoneum was opened a little below the umbilicus, near the scar left by the trocar when she was tapped, in the expectation that at this part some adhesions would probably exist. This was the case, but they were easily separated. The incision was completed upwards and downwards with a bent bistoury through the peritoneum, directed by two fingers. Several adhesions existed in different parts of the tumour, which now became fully exposed. The principal one however was to the omentum, which was spread over the upper part of the right side of the tumour, and was closely united to it. This adhesion was divided with the bistoury, and then the tumour, with some effort from its great size and weight, was raised from its situation. Being carefully supported by Mr. Frost, while Mr. Heath closed the wound as it passed out, and retained the intestines in their place, I was enabled to pass double ligatures through the pedicle, and having firmly tied them, divided it close to the tumour, which was thus liberated from its attachments, and removed. Two arteries bled freely, one in the divided omentum and the other in the pedicle; these being carefully secured, the wound was brought together by sutures and adhesive plaister, compresses of lint and linen were placed over the abdomen, and a many-tailed bandage, which had been placed under the patient in readiness, secured the whole. The operation was well borne by the patient, though she vomited towards the end several times. This however she attributed to some spirits of ammonia, and brandy-and-water, occasionally given to obviate faintness, which she says always made her vomit. The pulse remained firm, and within half an hour from being placed on the table she was again laid in bed. The quantity of blood lost did not exceed ℥vj. After being put to bed she complained much of pain and smarting of the abdomen. Mur. morph. gr. ss. in camphor mixture was given, which induced a tendency to sleep. The pulse varied from 72 to 90. After half an

[redacted]

hour, the pain continuing severe, the opiate was repeated. The strictest injunctions as to quietude and diet were given, the latter being confined to barley and toast water." 92.

We have not space for the minute account of the subsequent progress of the case given by Mr. Greenhow. Symptoms of inflammation in the abdomen arose. She gradually got worse, and died at 2, A. M., on the 9th, the sixth day after the operation. On examination of the body, the wound was found nearly healed throughout. On laying open the abdomen, the omentum presented itself adhering to the intestines, and its folds matted together. General, but not very strong, adhesions existed between the folds of intestine as well as to the walls of the abdomen. In addition to these, and other marks of peritonitis, the pylorus exhibited a distinct inflammatory blush, which extended two or three inches into the duodenum, gradually diminishing in intensity. In this situation, the mucous membrane was softened, and exhibited numerous points of ulceration. Two or three patches of similar vascularity and softening showed themselves at long intervals in the course of the small intestines, but without any ulceration. The peduncle to which the tumour had been attached, proved to be the left broad ligament of the uterus, and it appeared that the diseased ovarium after attaining a certain size, had passed over to the opposite iliac region, the uterus at the same time making a semi-turn on its own axis, so as to place its dorsum in the anterior position. A small portion of coagulated blood was found in the pubic region. The right ovarium and the uterus were healthy, but the cavity of the latter was lined with a fine vascular membrane resembling the decidua. The tumour, with the exception of one or two small cysts containing a few ounces of yellow fluid, was firm and solid, and the size of the uterus before delivery. It weighed 12lbs. 7 oz. avoirdupois.

"The general structure is cellular, but in many parts it is very dense; a number of small cells or cysts, however, pervade its substance, besides the larger ones already mentioned. One of these cells, about the size of a walnut, near the centre, contained a brownish pulpy substance, resembling thickened pus. The centre of the mass, for the space of several inches, was of a bright red colour, as if an active circulation had been carried on in the interior. The largest cyst, at the upper part of the tumour, was white and glistening in its interior, resembling the ordinary character of ovarian cysts; but the dense solidity of the general mass, and vascularity of the interior, distinguish this tumour from the other instances of ovarian disease which have come under my notice." 100.

Owing to the reduced condition of the patient from discharges of blood, this case was not so favourable for an operation as the preceding one. Mr. Greenhow believes that her convalescence after the inflammatory attack was very nearly established, and that, but for the diseased condition of the pyloric extremity of the stomach, her recovery would have been effected. At so early a period as on the sixth day* after the operation, and with unabsorbed lymph and coagula of blood in the abdomen, convalescence cannot be said to be established, and we must regard the morbid state of the pylorus as one of the results of the operation, probably induced by, and

* In the heading of the case, the day of death is erroneously stated to be the seventh.

not the cause of, the severe vomiting from which the patient suffered. Mr. Cooper and Mr. Greenhow are entitled to the thanks of the profession for fairly and faithfully recording the particulars of these unsuccessful cases. It is right to add, that, in both instances, the operation appears to have been performed with every care and precaution.

The following paper, though the last in the volume, may be advantageously considered after these two cases.

XI. Observations on the Recorded Cases of Operations for the Extraction of Ovarian Tumours. *By Benjamin Phillips*, F.R.S.

In this paper, the author has brought before the Society all the information which he has been able to collect on the subject of the extraction of ovarian tumours, in order to afford some aid in coming to a right judgment, whether this operation shall be classed amongst the benefits conferred by science upon man. It is remarked, that the opinion of any man, however eminent, pronounced without a careful estimate of the materials which have now become available to us, cannot and ought not to determine the question. He observes, that it has been the fate of some grave and dangerous operations, to be received into favour and admitted into practice from the moment they were proposed; and of others less grave and dangerous, to be assailed by great prejudice; whilst those who have desired to afford them a fair trial, have been exposed to censure and contumely; in either case the results of the operation being disregarded.

"In 1818, Mott placed a ligature around the arteria innominata, and the operation was unsuccessful; and yet, formidable as is the operation, and unvaried the failures in every instance, though performed by the ablest surgeons, it has been repeated twelve times, and still I have no doubt that men of the greatest eminence and most unquestionable skill would nevertheless resort to an operation the almost certain result of which would be death. The extraction of an ovarian tumour is much more simple, much less grave, than the ligature of the innominata, and yet by a large portion of the profession, and by some of the most celebrated of its members, it has been denounced as rash and imprudent. With a few exceptions it has not been performed by the more experienced and able surgeons either in this country or on the Continent; it has fallen into the hands of men less accustomed to perform great operations, and it may be not unreasonably assumed, less conversant with the after-treatment which may be needful. Although performed many times in London, I believe it has been introduced into no other Hospital than Guy's, and even were its performance more frequently called for, and its success more decided, it would hardly be classed amongst the recognised operations of surgery until warranted by the experience of Hospital practice." 471.

The operation of tying the arteria innominata for the cure of aneurism cannot be fairly compared with the operation for the removal of an ovarian tumour. In the first case the disease is so dangerous, that death is almost certain within a brief period, and the surgeon knowing from his experience of the efficacy of ligatures on arteries in cases of aneurism generally, that the operation affords the only chance of saving life, offers it as a *dernier ressort* to his patient. The next case may be a successful one, and if, in one case in thirteen, or even one in twenty, life is preserved, the operation is warranted; and it is so upon precisely the same principle, that in the case of two limbs irretrievably damaged by violence, we should am-

putate if necessary both thighs or both arms as the only chance of rescuing the sufferer from death—poor as that chance may be. But how different are the circumstances of a person with an ovarian tumour! The danger is distant—the patient will probably live at least four years, and she may survive twenty or even longer; whereas, if an operation be performed, the chances are nearly even that she dies in a week. We have a patient who has a large abdominal tumour which has existed for years, and been stationary for the last two. She passes her days in comparative ease, is able to perform the common offices of life, to enjoy society, and even to tend a sick husband. Until this can be said of a patient with a subclavian aneurism, no fair comparison can be drawn between the circumstances of these two cases.

Mr. Phillips gives a Table of eighty-one cases, in which are exhibited, the names of the operators, the ages of the patients, the nature of the operations, the state of the tumours, the results, and remarks on the cases. The Table includes cases operated on in this country as well as on the Continent. It would have been more complete and useful, if the authorities had been quoted. In sixty-one cases, the tumour was extracted: in fifteen cases, adhesions, or other circumstances, prevented its removal; in five instances no tumour was found. Of the cases in which the operation was completed, the tumour being extracted, thirty-five terminated favourably; the patient recovered: in twenty-six instances the termination was unfavourable; the patient died. Of the five cases in which no tumour was discovered, all recovered. Of the fifteen cases in which adhesions, or other circumstances, prevented the extraction of the tumour, nine recovered, six died. Mr. Phillips very justly observes, the proper way "of looking at this plan of treatment, is to observe the number of cases submitted to operation, and the number of recoveries after the removal of the tumour. I conceive this to be the fair way, because, what has happened already is, in my judgment, likely to happen again. Adhesions may be too strong and extensive to make removal prudent; the tumour may be other than ovarian, or it may be that no tumour can be found. Regarded in this light, it appears that the operation has been performed eighty-one times, and that in thirty-five instances the patient has recovered after the extirpation of the tumour. It is true, that forty-nine patients survived gastrotomy; but many of them were subjected to such a painful and dangerous operation, on the one hand without necessity, and on the other without being disembarrassed of the disease."

In order to estimate the relative advantages and dangers of the major and minor operations, Mr. Phillips has made two Tables, one including the cases in which the tumour was removed entire, the incision having an extent of six inches or upwards: the other, including those cases in which part or the whole of the fluid was evacuated before the extraction was attempted, the length of the incision having been under six inches. Of the former, there are fifty-five cases, twenty-three of which were successful: of the latter, there are twenty-seven instances, of which thirteen were successful.

In the consideration of these cases, the following points arise:

"First.—Can we determine, with certainty, whether a tumour be ovarian or not? If not, have the failures been so frequent as to constitute a reason why the operation should not be attempted?

"Second.—Supposing a tumour to exist, and to be ovarian, can we ascertain the nature of its contents, as well as its connections? If not, have the failures been so many as to be an objection to the adoption of the operation at all?

"Third.—Are the results of this plan of treatment sufficiently favourable to justify us in preferring extirpation to any other mode of treating ovarian tumours? And if so, what plan of operation promises most success?" 481.

In proof of the uncertainty of the signs of ovarian tumour is adduced the fact, that out of the eighty-one instances in which the operation for extirpation was attempted, five times, at least, the abdomen has been laid open, and no tumour discovered—and in six others the tumour was not ovarian. The patients recovered in all the instances in which no tumour was found, and hysterical or other tympanitis, or tumours of the omentum were the sources of error in the cases referred to. Though it must be acknowledged that in many instances the diagnosis of abdominal tumours is extremely difficult, yet many cases occur in which the surgeon can positively predicate the existence of ovarian disease, and we need scarcely say, that it is only in such cases where the nature of the tumour is plain and indisputable that an operation should be thought of.

With regard to the second point for inquiry, Mr. Phillips says "we have no certain means of ascertaining the contents and connections of tumours presumed to be ovarian. In six instances, the abdomen has been laid open, and the tumour has been found to be either diseased omentum, or diseased or gravid uterus. Many times a presumed ovarian cyst has been punctured, and no fluid has escaped; the operation has been a 'dry tapping.' I have been present when an operation has been performed for the extraction of the cyst, where, although the examination was made by men of tried ability, who had no doubt of the contents being fluid, yet not a drop of fluid was contained in it—it was a stiff jelly.

"With reference to connections or adhesions, the difficulties met with are still more formidable. In fifteen cases where the operation for extraction was commenced, it was found necessary to discontinue it, in consequence of the extent of the adhesions. In twenty-five other instances adhesions existed. Of the fifteen cases in which they caused the abandonment of the operation, six terminated fatally."

A Table is given of these fifteen cases of "*no extraction.*" Upon the subject of adhesions we find the following just remarks:

"This seems to me to be the pinching point of the case. I would admit, that a very careful and competent observer would not be likely to fail often, in his conclusions as to the existence or non-existence of a tumour, and as to its being ovarian or not; I would admit that he would not often fail in the determination of the contents, but I know no sure means of ascertaining whether there be extensive adhesions or not: in most cases, there are no physical signs by which we can determine this. Is it not certain that we can, in ordinary cases, cause the abdominal parietes to glide over the surface of the tumour; in many cases, persons are deceived by the gliding of the superficial upon the deeper-seated layer of the abdominal walls, and if we could, it would only avail for its anterior surface. The crepitating sign pointed out by Dr. Bright is only present when the adhesions are recent; and as to the motion of the tumour with the diaphragm, considerable adhesions may exist without much interfering with it. An examination per vaginam would not set the question at rest. Our main reliance is therefore upon the signs of peritonitis—if the evidence be clear that peritoneal inflammation has existed, it is probable that adhesions are present; but we may find adhesions where there has been no reason to suspect peritonitis. Still, extensive adhesions

in the absence of symptoms of peritonitis are by no means common. It is then mainly upon this point that we must rely before proceeding to operation." 485.

We quite agree with the author that the adhesions are rarely extensive without previous symptoms of peritonitis, and, allowing the extirpation of the diseased ovary to be a justifiable operation, we think that, in the absence of these symptoms, it may be undertaken with every prospect of being completed, and the operator may find encouragement in the fact furnished by Mr. Phillips's tables, that of the forty cases in which adhesions were found, twenty-six survived, which is at the rate of sixty per cent., whereas of the whole eighty-one operations, forty-seven recovered, or fifty-eight per cent. The great danger of this operation arises from peritonitis, and so far as our present experience warrants a conclusion, that danger is not increased by previous inflammation of the serous membrane and its consequences, adhesions, though their existence necessarily leads to greater disturbance of the important parts exposed in the operation.

The next point considered is whether the results on record justify us in preferring extraction to any other plan of treatment. We know that the operation for extraction is one of a very serious nature, but have we any other means of cure to propose? All internal and external remedies have failed. We may advise the patient to bear her sufferings, reminding her that large tumours of the kind have remained stationary for twenty years and more. But these are exceptions, and when the case gets worse, will you advise tapping, or the more serious operation of extracting the cyst? The tumour may not be fluid, but if it be so and you tap it, the cyst becomes refilled, it may be slowly, but usually in a few weeks, and thus repeated tapping is necessary, the intervals between the operations diminishing until the patient dies, worn out, the average duration of life from the first tapping not exceeding four years. On the other hand, "extraction, though not a very painful, is a dangerous operation: the experience we possess justifies us in the expectation that, in forty-four cases out of one hundred, the tumour may be extracted, and life saved: but at the same time it cannot be concealed that, out of the eighty-one operations to which we have referred, thirty-two died, and that soon—in fact in a few days."

The author remarks that, in many cases where disease affects one ovary to a large extent, it affects the other, though to a smaller extent; and it is possible that when the disease is removed from one ovary, the nutritive action which was previously directed upon it, may afterwards be concentrated on the remaining point, and cause its rapid development. This ground of apprehension appears to us chimerical. It would be as reasonable to decline an operation for lithotomy because of the liability which must remain to the formation of a fresh concretion, as to object to the extirpation of one enlarged ovary, in consequence of the remaining one being liable to become affected with a similar disease.

There is one material point bearing on this operation, overlooked by Mr. Phillips, which it may be as well to notice here, viz. whether the cystic disease to which the ovary is subject, is of a malignant character or not. Mr. Cooper states, in the paper which we have reviewed, that Dr. Bright, Dr. Hodgkin and Mr. T. King believe it to be so. There can be no doubt but that the ovary is liable to malignant disease, and that a malignant growth sometimes co-exists with the cystic disease; but if we could come

to the conclusion that ovarian cystic tumours are generally of a malignant nature, which is known to be the opinion entertained by Dr. Hodgkin, we should at once decide against the propriety of extirpation in any case, for it would always be impossible to ascertain beforehand that the disease is limited to the ovary. But, notwithstanding the high authority of Dr. Bright and Dr. Hodgkin, we have no hesitation in expressing the opinion that the ordinary cystic enlargement of the ovary is not of a malignant character, and may be extirpated without risk of leaving behind the germs of future disease in other parts.

With regard to the operation which should be selected, a point on which it appears that much difference of opinion exists, the calculations from the table tell, as we have already shown, rather in favour of the minor operation; the proportion of recoveries being forty-eight per cent., whilst in the cases of the major operation it was forty-two. Mr. Phillips's observation of the smaller incision is much more favourable: the operations being six, the successful cases five. Cases, however, may occur, in which an enlargement of the incision is absolutely required, as when the contents of the cyst, instead of being fluid, prove to be solid; but he observes, that circumstance does not in any way militate against the plan of making as small an incision as is consistent with the easy removal of an emptied cyst, provided it be large enough for the convenient application of the ligature round the peduncle. The statistics of the operation at present are by no means sufficient to decide this question. The length of the incision seems to us of less importance than the gentle manipulation of the parts, as we believe that the risk of peritonitis is very slightly if at all increased by the extension of the incision, certainly not so much so as by any force or rough handling which may be necessary, if the space allowed for the manœuvres of the operator be too limited.

The author's tables are defective in some particulars, which it is impossible for him at the present time to supply, but which we hope may be obtained at some future period, as they are of the utmost importance in determining the utility and necessity of the operation. It is desirable to know the duration of life and state of health enjoyed by patients after the operation, and whether persons, one of whose ovaries has been extirpated, have suffered any serious inconvenience from the incision in the abdomen and adhesions between the viscera, the result of peritonitis.

It must be observed, in conclusion, that the members of the Society, and indeed the profession, are under obligations to Mr. Phillips for the information which he has submitted to their consideration, and the importance of the subject and the many interesting points *sub judice*, upon which the facts accumulated in this paper bear, have led us to quote largely from it. It is not difficult to perceive that the tenour of the author's remarks is in favour of the operation, but it might have been expected that he would have given an opinion on the subject, based on the facts which he has taken so much pains to collect. Mr. Phillips has himself extirpated an ovarian cyst, has witnessed its performance by others in several cases; he is a lecturer on surgery, and is known to have paid considerable attention to the statistics of operations. We think, therefore, that he might without presumption have expressed something like a confident opinion on the propriety and value of the operation. For our own part, we have for some time come to the

conclusion, which is rather confirmed by the facts here presented to us, that, under the circumstances of a disease which, on the one hand may not destroy life for years, and commonly admits of palliative treatment and temporary relief; and on the other, can only be radically cured by means which it is nearly an even chance will destroy life within a week, the surgeon is not warranted in recommending so dangerous an operation to his patient. At the same time we do not altogether object to its performance. It sometimes happens that persons have to decide for themselves on what terms they will continue to enjoy life. What is tolerable to one may be intolerable to another, and many look with dismay on an operation to which others would cheerfully submit in order to be relieved from distress and inconvenience. A person with a large incurable ulcer on the leg, or with a permanent contraction of the knee-joint, will sometimes desire amputation rather than bear the constant annoyance of these complaints, and though the operation is one dangerous to life, the surgeon is held to be justified in complying with the wishes of the patient in performing it. The case of an ovarian tumour appears to us to belong to this class. We should not recommend the operation; but if a patient of sound constitution be anxious, after the risks of an operation have been fairly stated to her, to incur these risks in order to get rid of so serious, and in the end so fatal a malady as this disease, it is the duty of the surgeon to operate. We know of a case of recent occurrence in the country, in which a talented surgeon most reluctantly undertook the operation at the urgent desire of the patient. The result was perfectly successful, and no one who contrasts the present healthy condition of this person with her former state and prospects, notwithstanding the dangers incurred, can question the discretion of the operator in yielding to the pressing wishes of the sufferer.

XII. On the State in which the Uric Acid exists in the Urine. By *Henry Bence Jones*, M.A. Cantab.

The author first gives the opinions of the chief chemists on this subject. Berzelius mentions Dr. Prout's view of the uric acid existing as urate of ammonia, and then states his own, that uric acid most frequently is in an uncombined state; but perhaps modified by the presence of other matters. Dr. Simon thinks that urine may contain free uric acid, and also urate of ammonia. Becquerel says, that the ordinary fine amorphous powder which is deposited from acid urine, consists of uric acid combined with colouring matter and the (so called) extractive matters of the urine. We shall not follow the author in the analysis detailed in this paper, but must refer those interested in the subject to the work itself. It will be sufficient to observe that, from his experiments, it appears that urate of ammonia, when dissolved with about an equal weight of salt, acquires a greater degree of solubility in water, and a difference in appearance from pure urate of ammonia. The appearance is identical with that deposit which can be obtained from urine, and the solubility is more than double the solubility in distilled water. The author tried what effect the salt would have on pure uric acid. He found one part of uric acid remained in 8·941 parts of water, at 68° F., and one part of the uric acid, with salt, remained in 7·199

parts of water at 64° F. These results tend to establish Dr. Prout's opinion, by showing how urate of ammonia is modified in form and solubility. The experiments made by Dr. Jones may give a further insight into the various cause of that frequent deposit of urate of ammonia which occurs in health. A small quantity of salt increases the solubility of this substance; the muriate, the sulphate, and the acetate of ammonia, lessen the dissolving power of distilled water. He concludes, "it is most probable, that each salt that occurs in the urine has some effect on the solubility of the urate of ammonia; and it may be by a very extended inquiry into the relative re-action of the different salts, more particularly the phosphates and sulphates, that we may arrive at an accurate knowledge of the causes of the frequent deposit of urate of ammonia in the urine."

XIII. Carcinoma of the Lungs. By *George Burrows*, M. D.

Carcinoma in any part of the body is a terrible disease. In the mamma, the uterus, even in the lip, it is a horrible affliction. In the lungs, and especially in its open state, it is the most direful of all. A few years ago we attended a young married lady, who laboured under this disease. The breath and the expectoration emitted such a malaria, that it was scarcely possible to stay a quarter of an hour in the same room with her, and the effluvium was so dreadful to herself that she twice attempted suicide! The odour of cancer is so peculiar that no person can mistake it. It differs totally from that horrible stench attendant on gangrene of the lung, and is, alas! much more lasting before life becomes extinct. This lady laboured under the malady for years before death terminated her sufferings.

The case which Dr. Burrows relates, did not apparently arrive at the state of open cancer, and did not present the fetid breath to which we have alluded. It was a young married female, aged 20 years, who entered St. Bartholomew's Hospital 22d April, 1843. She had been ill only six months. She complained, at first, of pain beneath the sternum, loss of appetite, cough, and some expectoration, followed by want of sleep, emaciation and perspiration. A month previous to admission, had an attack of hæmoptysis, succeeded by a pink-coloured sputum. She suckled a healthy child three months old. On admission, she presented the following phenomena:—

"The face pallid, rather full and œdematous, with a dark areola around the eyes; the lips rather livid; the alæ nasi acting violently with each inspiration: respirations 40 in a minute; the pulse 132, rather small, bounding, but soft, and increased to 160 when she assumed the sitting posture in bed; the decubitus on the back, but inclining to the right side.

"She complains of weakness, pain between the shoulders, and gnawing pain in the epigastrium; also of shortness of breath and of frequent prolonged paroxysms of ineffectual cough, which are followed by urgent dyspnœa amounting to panting; the sputa are scanty, glairy, intimately blended with blood, and of a uniform pink colour, resembling currant-juice; the glandulæ concatenatæ on the right side of the neck are swollen, hard and tender, with some distended veins passing over them. The glands on the left side of the neck are also slightly enlarged, and the left external jugular vein distended. The tongue clean and moist, the abdomen full, soft, and rather tender on pressure in the umbilical

region; the bowels open twice daily; the catamenia had not appeared since parturition." 122.

On auscultation, a clear exaggerated respiration, with an increased resonance on percussion, were audible over the left lung—on the other side, a diminished resonance in the upper part; while below the third rib, in front, and beneath the spine of the scapula, there was complete dulness—this dulness extending down to the right hypochondrium. There was a feeble respiratory murmur in the upper part of the right lung. The heart's sounds were natural. The diagnosis was, that she laboured under "extensive malignant disease of the right lung."

We need not follow the details. She died on the fifteenth day after admission.

"The right pleura was distended by Oiv. of an olive brown-coloured serum. In spite of this large collection of fluid, the right lung had not collapsed, but stood out firm and prominent into the pleural cavity. The upper lobe of the lung was not much altered: its substance was tough and crepitating on pressure, the middle and lower lobes when handled felt solid. A white lobulated tumour of a dull white colour, something like a mass of suet, projected from the middle lobe of the lung; it was somewhat yielding on pressure, and in close apposition with the right side of the pericardium. Towards the root of this lung was another similar tumour, which forced the lung upwards from the spinal column. The middle lobe was intimately connected with these tumours, and much resembled them in external appearance. The pleura covering the lower lobe was rough and dark-coloured, with enlarged, congested, varicose blood-vessels, ramifying on the surface.

"When sections of the middle lobe and tumours were made, they appeared one continuous mass of carcinoma. Their substance was mostly of a uniform dull white colour, and rather soft; in some parts the substance was pinkish or red, as if vascular; and in other points, especially in the situation of the bronchial glands, the cut surfaces were streaked with black lines and spots, and divided into oval segments. The surfaces yielded on compression a white creamy fluid in considerable quantity." 127.

The diagnosis formed at the beginning, was, if no good luck occurred, one of those extreme instances of auscultic science, which happen once in a century, and to one in a thousand practitioners. We would not advise the tyros of the profession to stake their diagnostic knowledge every day on such minute distinctions. It is only by the "*tactus eruditus*" and the exquisite ear of a master in the art of percussion and auscultation, that a man can hope to predict with the accuracy presented in the foregoing case. We agree with the talented author, that when such a malignant disease as the above is detected during life, the exhibition of mercury, long repeated counter-irritation, frequent blood-letting, &c. "can only impair the vital powers, without arresting the local complaint." But is not the same reasoning to be applied to almost every disease so interfering with the functions of respiration? Can we cure old-standing consolidation or tubercular infiltration of the lungs by medicine? We fear not. "*Optima hic est medicina, medicinam non facere.*"

XIV. Cases of Acute Disease in the Throat and Larynx. By Dr. *James Arthur Wilson*, Physician to St. George's Hospital.

There can be no doubt that many lives are lost by the above inflammations for want of tracheotomy. In Nov., 1830, Dr. Wilson, with Dr. Nevenson and Mr. Keate, attended a gentleman who died of cynanche supervening on erysipelas. On examination, the epiglottis and posterior membrane of the tongue were found to be highly vascular and thickened, and pus was infiltrated in the cellular membrane of the fauces. The larynx, below the cordæ vocales, and the trachea, were free from disease or obstruction. Here was a case where tracheotomy would have saved life, almost to a certainty. The event made a deep impression on Dr. W.'s mind, and was of service thirteen years afterwards.

Case.—Mr. W. C. aged 27, full habit, got heated at a ball, and caught cold going home. He was unable to sleep, from general uneasiness and sense of choking on attempting to swallow. Leeches, calomel, and other measures, were employed; but the breathing was not relieved, even by the abstraction of twenty-four ounces of blood from the arm. In the evening of July 8, 1843, he was in extremis, and Mr. Keate exposed the trachea below the thyroid gland, and made an opening into it, inserting a canula in the aperture. Instantaneous relief was the consequence.

"On the first rush of air into the trachea, the patient appeared to feel instant relief, and his countenance began at once to resume its natural expression; *but* from this time not two minutes could have elapsed, when he was suddenly attacked by most violent spasms of his whole frame, with a struggle for breath, as if threatening immediate suffocation. All consciousness directly ceased, the eyelids closed, the face was livid, the features were distorted, the blood, still bubbling from the wound, became suddenly black as ink. The breath was drawn convulsively, and at long intervals. All movement, excepting that of the pulse, had ceased, and the patient appeared, literally, at his last gasp. During this awful crisis of the young man's fate, which lasted for perhaps a minute, (seemingly for a much longer time,) his head was held forcibly back,—the canula was withdrawn,—and the orifice in the trachea cleared from blood, and kept widely open. The breathing at length became more natural; the face, no longer ghastly, began to resume the character and tint of life. Not long after this most fearful convulsion, a large quantity of mucus, mixed in part with blood, was rejected, in long viscid ropes, from the mouth; and it was then found that the patient again breathed through the larynx. Upon this, the canula was finally withdrawn. A profuse perspiration now burst forth from the face, neck, and chest of the patient, who gradually recovered his consciousness, and expressed by writing that his 'breathing was quite easy.' He slept at intervals during the night, and was convalescent from this time." 140.

Although, as Dr. Wilson remarks, the operation can hardly be too late, yet the chance of success is greatly lessened by delay, because the patient is being poisoned by his own blood. There is a good deal of management necessary in preventing the blood from flowing down the trachea into the lungs. The operation of tracheotomy has now been so often performed with success, that no patient should be allowed to be suffocated by obstruction about the throat, without opening the wind-pipe. A gentleman of our acquaintance breathed more than twenty years through a tube.

XV. On the Presence of Oxalate of Lime in the Urine. By *Henry Bence Jones*, M.A., Cantab.

The author observes that the appearance of octohedral crystals in the urine appears first to have been described by M. Vigla. Dr. Bird in England, and afterwards M. Donné in France, recognised the very frequent occurrence of such crystals, and by re-actions observed by the microscope, inferred that these crystals were oxalate of lime. A case occurred to Dr. Jones, in which, from the quantity of octohedral crystals passed, he was able to examine the sediment in nearly the usual method. He remarks:

"The states of the system in which octohedral crystals are seen, vary exceedingly. In acute rheumatism and gout, chronic rheumatism, aggravated hypochondriasis and hysteria, and diabetes, I have found such crystals. In one case in which the rheumatism was slight, the influence of diet and exercise on the mixed deposite of urate of ammonia and oxalate of lime was made the subject of experiment. In other cases in which these octohedral crystals occurred, the symptoms were altogether different; irritation of the urinary organs being the most prominent. The concretion of the crystals, into oxalate of lime-gravel, seemed in one patient to be the cause of this diversity of symptoms.

"The connection observed by MM. Donné and Rayer, between seminal weakness and oxalate of lime, I found in two cases; and in a third, where three small oxalate of lime calculi had been passed at long intervals, and octohedral crystals were constantly found in the urine, on one examination a few dead spermatozoa were seen." 147.

John Saunders, æt. 47, formerly a soldier, was admitted an out-patient of St. George's Hospital. The deposit which had been continually observed in the urine was examined in March, 1843, and found to consist of innumerable crystals of uric acid mixed with octohedral crystals. For twenty years he had suffered more or less from urinary disorders. In 1828 he had rheumatic fever, and was confined to bed eleven weeks. The small joints of the fingers are larger and stiffer than natural, and occasionally very painful.

"The urinary sediment was thrown on a filter and washed with distilled water. The red residue was dried, reduced to a fine powder, and treated with dilute hydrochloric acid, which left most of the uric acid undissolved. The acid liquid was filtered, and ammonia gave a very considerable precipitate, when added in excess. When evaporated to dryness, and heated on platinum, the muriate of ammonia was driven off, and the residue effervesced strongly when thrown into dilute acid, and left an alkaline ash when heated more highly. The ash was with difficulty soluble in water, and gave a precipitate with oxalate of ammonia. Hence some organic acid salt of lime was present; and as oxalate of lime is known to occur in octohedral crystals, the conclusion that these crystals were oxalate of lime is most probable." 148.

The author examined the urine of a patient of Mr. Cutler's, and at the same time three small renal calculi which passed in July, August, and September, and afterwards another which passed in October. The urine under the microscope contained multitudes of octohedræ mixed with some crystals of uric acid. All calculi were found to consist of oxalate of

lime mixed with uric acid. He examined the urine in cases of acute rheumatism, and always detected the presence of these octohedral crystals. This deposit is also frequently found mixed with urate of ammonia in chronic rheumatism. In one case he was enabled to make some experiments regarding the effect of diet and exercise on the deposit, and he observed that the octohedral crystals seemed to vary in quantity at different periods of the day. Then follow the daily results of this experiment, which are given very minutely for the four weeks during which it lasted. The author states that it would be easy to multiply examples of the connection between octohedral crystals and rheumatism; but, as no variation in the treatment of ordinary rheumatism seems to be thereby indicated, the fact seems only interesting, as showing the close connection between the red deposit and octohedral crystals. He adds, "octohedral crystals in the urine, and symptoms of a totally different kind, frequently occur together. The patient complains of pain in one or both loins, of frequent desire to pass his water, which is sometimes in very small quantity; at other times so much as to simulate diabetes. There are sudden calls to empty the bladder, and if it is delayed, considerable pain is produced. The urine when examined contains only a slight cloud, which does not disappear with heat. In other respects it appears natural. When examined with the microscope, the cloud is seen to consist sometimes entirely of octohedral crystals. More frequently of these crystals mixed with globules of mucus, and sometimes with large and small scales of epithelium."

The above symptoms closely resemble those produced by a small calculus in the kidney, and in one case they suddenly ceased after sharp pain in the course of the right ureter, and slight retraction of the testicle.

Dr. Jones concludes by remarking, that the treatment which proved most beneficial in these cases of irritation was that which improved the general health. In two of Mr. Cutler's patients the symptoms followed mental anxiety. Medicines had little effect, but as the causes for anxiety disappeared, the symptoms ceased.

This paper is a valuable contribution to our knowledge of urinary disorders. We shall return to this important volume in our next number.

A PRACTICAL TREATISE ON [illegible]
Illustrated by Cases deriv[illegible]
By *Samuel Ashwell*, M.[illegible]
sicians, London; O[illegible]
pital. 8vo. Part

HAVING formerly

he intended it to be a safe guide in practice, and while he has proved himself thoroughly acquainted with the controverted pathology of female disease, he has avoided obscuring his own views by any forced attempt to make them harmonize with the opinions of others. His work is eminently his own; he has seen frequently that about which he has written; he has tested the worth of his diagnostic precepts by constant and accurate observation, and his treatment of the various maladies is evidently the result of most extensive and often very successful practice. Nor is there any dogmatism or vanity about his writing. The style is plain and forcible; without any dark passages, incomprehensible either by himself or his readers. In some places, however, Dr. Ashwell takes a little too much for granted; he supposes that others are as fully acquainted with female disease as he is. and therefore occasionally neglects a full exposition of his prognosis and remedial management.

We are glad Dr. Ashwell has had courage and candour enough to confess that, even with all the advantages of Guy's Hospital and a very extensive private practice, he has seen but few examples of some of the very rare diseases: this is as it should be, and affords a striking and instructive contrast to some of the French writers, who, as in M. Lisfranc's instance, exhaust the credulity of their readers by announcing the startling fact, or rather falsehood, that they have seen "hundreds of cases of a disease," (anteversion of the womb,) which, even in the largest fields of observation, occurs only extremely rarely.

We congratulate the author on another important point—the authentication of his cases. We are aware this cannot always be done, but certainly it is a matter of great moment. The case is the portraiture of the history of the disease, and as there are false facts in philosophy, so there may be false cases in medicine. Dr. Ashwell has given great additional authority to his work by an admirable selection of cases; the truth and reality of which no one can doubt. Let us not be misunderstood: we say again it cannot always be done; but we are sure it is often neglected where no real difficulty exists. Dr. Bright, a distinguished colleague of the author, and some other writers, have advantageously availed themselves of a similar verification of their reported cases, and we trust ere long to see it far more generally adopted.

The chapter on polypus contains an excellent summary, not only of the practice, but likewise of the pathology, of this important disease. Dr. Ashwell has not failed to embody some of the peculiar views of Lisfranc, nor has he hesitated to express his disapprobation of some of his measures. We agree with him in his incredulity about such frequent "enucleation," and in his condemnation of severe and violent efforts to abstract polypi while still high up in the uterine cavity. There is much force in Dr. Ashwell's remark, "such things don't require to be done in Eng'and." But we think the author is yet too cautious and careful about removal by the knife, as we are confident, in many instances, it is far better and safer than the ligature. We shall, as in our former reviews, allow the author to speak for himself in an extended analysis, assenting or dissenting as we proceed.

The following is his definition of polypus:—

"*A firm and insensible tumour, usually round and smooth, and growing by a*

stalk either from the mucous lining of the uterus, or the structure beneath; its chief symptom being hæmorrhage. It commences in the cavity of the womb, in the channel of the cervix, or from the os. It is often of fibrous texture, not malignant, and rarely ulcerates. It is covered by mucous membrane, and sometimes by an adventitious coat, the product of inflammation. There is little pain, menstruation is excessive, and conception may occur."

Dr. Ashwell observes that polypus of the uterus, while it is not an uncommon disease, is certainly far more rare than cancer. In the following remarks we entirely concur.

"There is no malady more certainly curable than polypus, although many patients have died from its accompanying bleedings, without its existence ever having been suspected, much less ascertained. The necessity for vaginal examination, where profuse uterine bleedings resist the remedies employed for their suppression, cannot be too strongly urged. In the hæmorrhages of polypus, astringents are useless—the only effectual remedy is removal.

"Pain can scarcely be said to be a symptom, and the first suspicion of the disease is excessive menstruation, or bleeding occurring in the catamenial intervals. Although the evacuation of the bladder or intestines is seldom prevented, it is not impossible that a large polypus, by pressure on the urethra or rectum, or both, may obstruct their functions. Hence, if the patient be strong, the loss of blood seldom attracts notice, till some of its injurious effects begin to be realized. When the digestion becomes impaired, and there is leucorrhœa, deadly sallowness, difficult respiration, and other evils,—then anxiety begins, and it is not long till a reluctant permission is granted to examine the state of the womb."

There is considerable variety in the size of these growths. Some, not larger than a garden bean, have bled alarmingly; while a polypus exceeding a Seville orange in size, scarcely bled at all, ultimately producing irritation by its pressure on the neck of the bladder, and great exhaustion by constant and large secretions of pus. We are glad Dr. Ashwell has dwelt on this fact, as the continuance of purulent discharge, and the almost entire absence of hæmorrhage, has induced most injurious delay in ascertaining, by a proper examination, the existence of the disease. The protracted inclusion of a polypus within the uterine cavity is perplexing and dangerous; as a small one, especially if it be soft and vascular, may give rise to alarming and even fatal losses of blood. We insert the following case entire, as it is an instructive one, and conveys a good idea of the author's clear and forcible style of writing.

"Such instances have occurred in my practice, and a hard polypus of moderate size, now in Guy's Museum, removed when it had very partially descended through the cervix, fully attests the truth of the preceding observations. This polypus grew so slowly, probably because the hæmorrhages had been frequent and excessive, that three years elapsed prior to its coming within the reach of the finger. During this period, the patient had been frequently seen by eminent obstetric physicians, who in vain attempted to restrain the bleedings. At first, as she believed it to be entirely useless, I was not permitted to make an examination; but, on my assuring her, that although the growth had not yet descended into the vagina, it might speedily do so, she consented; and I had then the opportunity of touching a small, hard, and insensible tumour, just emerging from the os. The bleeding which followed alarmed me so much, that, before leaving the house, I attempted its removal. Excision was out of the question, and with a very long instrument, I made two unsuccessful efforts before I could apply the ligature. When completed, the canulæ were some way within the channel of the cervix. It was an anxious case, for there were several

bleedings within the first two days, and from one of them it did not seem for some hours that she would have rallied. During the twelve days the ligature was applied, the patient was never quite free from uterine pain. Often I had to loosen the whip-cord, to foment the abdomen with hot gin and laudanum, and twice a day to give an opiate. At length, however, to my great gratification, both the instrument and the polypus came away. The swollen legs and feet, the deadly paleness of the skin, and the universal anæmia gradually vanished, and the patient is now, after a lapse of several years, in confirmed health."

There can be no doubt, that women have died from hæmorrhage, or the diseases resulting from loss of blood, where a polypus had really descended into the vagina, which might have been early and easily removed; and many have been lost from similar bleeding, where the growth was shut up in the uterine cavity, and *beyond* the reach of surgical assistance. M. Lisfranc would probably deny the accuracy of this last conclusion: Dr. Ashwell, we can easily suppose, would decline an operation in cases where Lisfranc would unhesitatingly attempt one. The former practitioner would dread inflammation and gangrene as the consequence of the necessary surgical violence; M. Lisfranc would proceed regardless of such a risk, trusting, for his justification, to the certainty of death from continued hæmorrhage if the polypus were not destroyed. We do not regard our author as an infallible guide on such a point, but we confess we had rather submit to his discretion, than resign ourselves to the headlong procedure of the French surgeon. Nevertheless, we do think there are cases where fatal hæmorrhage might sometimes be averted by greater boldness and an earlier operation.

Dr. Ashwell has furnished a full and correct account of the various kinds of polypus, and the reader will obtain much valuable information from its perusal. The principal pathological conditions of these growths consist in their proneness to bleed, their insensibility, and their non-reproduction after removal. Our author regards the hæmorrhage from polypi as furnished by distinct blood-vessels existing in the growth itself, and of course communicating with those of the uterus. In the following remarks we concur:

"Polypi are devoid of nerves, and are therefore insensible. Occasionally, however, it is probable, that portions of the uterus grow into, and form a part of the morbid structure itself; thus accounting for the continued, and sometimes severe pain produced by the first application and subsequent tightening of the ligature. It is not difficult to imagine, where a polypus has originated in the structure of the uterus, deeper than the mucous membrane lining its cavity, that for a time it will be imbedded amongst the uterine fibres; but as it grows towards the cavity, these fibres being distended and thinned, will eventually give way; and the polypus will henceforth be covered almost entirely by mucous membrane, that portion of the polypus only nearest to the uterus being invested by the proper tissue of the organ."

"I may say, that I have very seldom tied a polypus where any bleeding occurred after the lapse of a few hours from the noosing. And further, that in only two or three instances after either tying or excision, has there been any alarming loss of blood.

"It is not easy to understand, if the bleeding did not arise from the polypus, how Dupuytren could be correct in asserting, that, after his many operations by excision, alarming hæmorrhage scarcely ever occurred.

"Bleeding, after either ligature or excision, will probably depend on the condi-

tion of the uterine tissue surrounding the base of the polypus. If this and the structure beneath are healthy, there will rarely be hæmorrhage; if, on the contrary, they are soft and highly vascular, bleeding may occur."

Malignant Growths and Ulcerations of the Uterine Cavity.—These are rare, if we except those arising during the progress of carcinoma; and the author remarks, that he has seen only two specimens of fungi in this situation unconnected with cancer. "In one, an out-patient at Guy's, which destroyed life by bleeding, the growth reached nearly to the cervix, being raised about a quarter of an inch above the surrounding tissue; but in most of these instances the productions were probably connected either with polypi, moles, hydatids, or cancer."

The treatment can only be palliative. "The strong alum hip bath, (a pound of the salt to a gallon of water,) care being taken that the fluid passes up the vagina—is one of the best remedies. Many other auxiliary means may be tried; and if the diseased mass, or a large portion of it, shall pass into the vagina, it may be removed by ligature, or by any more suitable method."

Spongoid Tumour, or Fungus Hæmatodes Uteri.—Our author is not afraid to say he has seen but one example of this very rare disease. The *history*, he tells us, "differs from cancer, the enlargement not commencing in the cervix, but in the body, and rapidly, as in the case I had under my care, affecting the entire structure. If examined by the rectum, the uterus, much larger than natural, is felt to be lobulated and elastic, and without any induration. Its mischievous effects on the general health are early apparent: the pulse being quickened, the strength rapidly failing, and the stomach and other organs quickly giving way. The pain is said to be agonizingly severe, and occasionally lancinating: and, probably even before ulceration is set up, there are profuse sanguineous discharges: in their intervals there is an almost constant escape of an offensive, dark-coloured, purulent fluid, which not unfrequently, by its acrimony, excoriates the pudendum. The pain increases as the disease advances, and the final termination is similar to carcinoma. In the case above alluded to, although there were many symptoms resembling cancer, the larger size of the uterus, its rising above the pubis, and the freedom of the vagina and rectum from induration, sufficiently establish the diagnosis. The os was capacious enough to admit one or two fingers; and ulceration had affected its posterior lip. As to *treatment*, it can only be palliative, and the observations on this subject, appended to the chapter on cancer, are equally applicable here."

Ulceration of the Mucous Lining of the Uterus.—This is the least common of the diseases to which the womb is liable; and Dr. Ashwell has not seen an example. These admissions without any attempt at concealment do the author great credit: indeed, in all the affections of the uterus, his opinion of their average occurrence may be safely taken. Guy's Hospital has been open to him for many years, and, together with an extensive practice, has afforded him excellent opportunities for a correct appreciation of their frequency. We are much pleased, too, with the manner in which Dr. Ashwell speaks of other writers. He is evidently desirous to procure for them a full and just share of praise, and we never

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find him withholding from their works the authority and weight they deserve. We shall follow his example by inserting, on account of its extreme rarity and value, the following narrative.

"Dr. Francis Ramsbotham preserved a preparation of this disease, in which the organ acquired the size of a pregnancy of the fourth month, and where, being turned inside out, it was seen to be everywhere ulcerated. The parietes were not more than a quarter their natural thickness, and there was a ragged aperture at the fundus, large enough to admit three fingers.

"Dr. Ramsbotham, senior, and Dr. Gooch, seem to be the only authors who have noticed this affection, and it is somewhat singular, that they both record the same case, having seen it together. The following is the history of its progress, and of the appearances observed on dissection, as published by the son of the former distinguished physician:—

"The lady, the mother of a family, considered herself between three and four months advanced in pregnancy; but the abdomen was enlarged to a size equal to what it has usually acquired towards the close of gestation. When my father first saw her, the uterus was distinctly perceptible above the pelvis, large, firm, resistant, and acutely painful throughout its whole extent, on pressure being applied. One portion of it, within the right ilium, was more tender than the rest. She had a dejected countenance, and was suffering under fever, with great irritability of stomach, and excessive irritation over the whole surface of the skin. She had been the subject of a constant discharge from the vagina for the preceding five or six weeks, in greater or less quantity, sometimes perfectly sanguineous, at others more serous, but devoid of unpleasant odour. Her increase in size had been uniformly progressive, though rapid. As in her last pregnancy, a dropsical state of the ovum occurred, the inordinate enlargement of the uterus was now attributed to the same cause. She became worse, and Dr. Gooch saw her in consultation with my father and her other professional advisers. On an examination per vaginam being now made for the first time, doubts arose both in Dr. Gooch's and my father's mind, as to the correctness of her opinion that pregnancy had occurred. The cervix uteri was found elongated and thickened, the mouth soft, flaccid, and sufficiently open to admit the passage of the finger within it about half an inch, but no substance could be detected in the cavity. The treatment directed was merely palliative; and as the bad symptoms became aggravated, on another consultation, five days after the former, it was determined to introduce a catheter within the uterus, that the liquor amnii might be evacuated, provided it contained an ovum. The instrument passed high up without encountering any impediment or obstruction; it could be 'moved about as if *in vacuo*.' A few hours after this means had been adopted, periodical pains came on, with a little increase of uterine discharge: these ceased spontaneously, in a short time exhaustion supervened, and the same day she died.

"On inspecting the body after death, it was remarked that the abdomen was tumid, and soft under the hand, having lost its former firmness. The peritoneal cavity contained a quantity of offensive gas, which escaped on the parietes being divided. The uterus was as large as though six months of pregnancy had elapsed. Its external surface was preternaturally red; it was flabby in texture, and, on squeezing it, some blood escaped through the vagina, mixed with puriform and serous fluid. The parietes were softened, and had much of the appearance of the gravid state. The cavity, which would easily have held the head of a child at birth, contained no fœtus, nor any other substance that could be looked upon as the result of impregnation. The whole internal membrane was destroyed by ulceration, and the surface was granulated. Adherent to the back part of the body was found a shreddy fibrinous mass, the size of a large egg, entangled among the irregularities of which were coagula and a quantity of bloody puriform matter. At different points near the cervix, the structure was eaten through nearly to the peritoneal covering.

"With regard to the treatment of such a case, we know so little of its nature,

that I can only recommend you to palliate whatever dangerous symptoms may arise. If, indeed, we were quite sure the disease under our care was of this kind, astringent fluids injected into the uterine cavity by a properly contrived syringe, might induce a more healthy action, and perhaps, in the early stage, be productive of essential benefit."

Physometra of the Uterus.—The author has never seen a true case of tympanites—one where the air has been the product of morbid secretion from the uterine vessels, and where, from the closure of the os, it has been allowed to collect for weeks or months in the uterine cavity, and has then, either spontaneously or by operation, been expelled; but he has several times been called on to cure explosions of gas from the vagina, which, forming in the uterus, escaped involuntarily, and with so much noise as to prevent the sufferer from venturing into society. This, we apprehend, is the usual extent of the disease, notwithstanding the many *singular* examples mentioned by different authors.

"It is said, that air has been known to accumulate in the uterine cavity after the death of the fœtus, or between the amnion and chorion, the fœtus being alive; and Baudelocque was present, *where the gaseous exhalation occurring after death, was sufficient to expel the child!!*" The author may well express his surprise and incredulity; such things do not occur in this country, although it is in some respects a land of wonders.

Peter Frank, a name of high repute, relates an example, where, after death, the uterus was hard, enlarged, and elastic, and full of gas of a very fetid smell. There was also ulceration in the cavity, and the neck was indurated. In another case, the os was closed by a polypoid growth. By the same author it is stated that, in the wife of a German physician, the accumulation of gas was so great, that the womb reached from the pubis to the diaphragm.

In a patient of Dr. Gooch's, pregnancy always cured the disease; while, in another, the uterine origin of the gas was confirmed, by the fact, that the instant pregnancy occurred the malady ceased, returning a few weeks after delivery.

"Idiopathic uterine tympanites is no doubt an exceedingly rare disease. Physometra, on the contrary, dependent on chemical change in the secretions, although a rare, is a more common affection. Thus the menstrual fluid, the vaginal and uterine mucus, coagula resulting from menorrhagia or dysmenorrhœa, the ichor of cancer, portions of placenta or of polypi, may, by their partial or entire decomposition, give rise to larger or smaller quantities of gas. A few months ago I had to remove a large mass of partially adherent placenta, which for three weeks subsequent to labour had caused frequent and large hæmorrhages. On entering the uterine cavity, which was partially blocked up by a firm coagulum, Mr. Woolnough, a student of Guy's Hospital, and myself, were surprised by the escape of an immense quantity of fetid gas, doubtless the consequence of the putrefaction of the retained viscus."

"*Treatment.*—In cases where such accidental circumstances have not led to the cure of the disease, or where the gaseous accumulation causes severe and extensive pain, nausea, and vomiting, or difficult breathing, the introduction of a canula, or a long and elastic, yet firm male catheter, will certainly open a channel for its escape. How long the instrument should remain will depend upon the evacuation of the air, and on the likelihood of irritation and inflammation; nor will the management be quite so simple, if adherent masses of placenta, polypoid or fungoid growths, are the causes of the disease. Some authors, in order to effect a permanent cure, advise the injection of the cavity of the womb with

warm water, weak solutions of chlorine, and chalybeate and astringent lotions. My present experience, independently of the frequent dangerous results of such uterine injections, would lead me to believe that they can very seldom be necessary."

Hydrometra, or Dropsy of the Uterus.—This, like physometra, is a rare disease, but, unlike the tympanitic affection, is often dangerous. Dr. Ashwell makes some interesting observations on aqueous discharge after parturition: indeed, the whole of this section deserves careful study. During the last ten years, neither amongst the in nor the numerous outpatients of Guy's Hospital has there been a single case; a tolerably satisfactory proof of the extreme infrequency of the affection. The early *symptoms* comprise indigestion, nausea, and vomiting, flatulence, pain, and costiveness. Early in the *idiopathic* variety, the accumulated fluid is generally serous or mucous, containing albumen, thick and inodorous; but as the disease advances, the contained fluid becomes dark, thick and offensive. In the *symptomatic* hydrometra, the dropsical secretion must of course frequently be mixed with blood or pus. "Authors," says Dr. A., "differ as to the quantity of fluid, the more reasonable assigning the moderate measure of pints and quarts, as the usual extent of the dropsy; while abroad, *where wonders are more common*, (and in this remark we concur,) Blanchard, in one case, found eighty-five pounds of an ichorous and oily fluid; Vesalius 180 lbs.; and Bonet, who need not fear competition in the marvellous, relates an instance, *where the uterus, under this disease, was capable of holding a child six years old!*" "Credat Judæus."

"*Pathology.*—From what has been said as to the *varieties* of hydrometra, it will be inferred that the pathological conditions associated with it must be different. Thus, in Dr. A. T. Thompson's case, the uterus was perfectly healthy, with the exception of a sphacelated portion of the peritoneal covering of the fundus: while in Mr. Coley's, of Bridgnorth, the womb was entirely diseased: both these interesting narratives I shall annex, not only because they are authenticated by two well-known practitioners, but because they furnish the best description of the commencement, progress, and termination of the malady which I have yet read.

"However complicated, therefore, may be the diseased states of the womb, two conditions are essential to hydrometra; first, that there should be increased secretion from the lining membrane, or from some growth or ulceration of its surface; and, second, that there should be impermeability of the channel of the cervix.

"Burns says, that one large hydatid filling the cavity of the organ, constitutes the malady; and Denman once saw an empty cyst of the form and size of the uterus, expelled after the discharge of the dropsical fluid it had contained. It is clear that the former celebrated writer has not assigned the true cause.

"*Treatment.*—For this it is sufficient to refer to physometra, the evacuation of the fluid, the prevention of future accumulation, and the re-establishment of the health, being the points of especial consequence."

Of Uterine Moles.—This term is not accurately defined. All fleshy and shapeless masses, irregularly passing from the uterus, have been thus designated; but the author says, they may originate from the ovum, which has been early blighted, or which has been only imperfectly developed; from a portion of retained placenta; from the firm clots of dysmenorrhœa; from a polypus spontaneously detached and shut up in the uterine cavity; from fibrous portions of coagulated blood, or from the hardened mucus of

the uterus itself. There are, therefore, two kinds of uterine moles, viz. those which are the product of conception; and those which are independent of pregnancy. Of course the majority of such cases may be traced to conception as their first cause: but it is also certain that there are moles and hydatids which do not thus originate. Moles differ much from each other; sometimes not resembling any animal form, but rounded with an external coating like skin. The author remarks that there are several examples in Guy's Hospital Museum of the mole which has been termed "the false germ," where the embryo is absent, while the membranes are somewhat perfectly formed.

"All pathologists allow the existence of those moles, however differently they may explain the circumstance of their formation, where the embryo having died early, the ovum being retained, has increased in size and solidity, not by a process of growth, as in natural pregnancy, nor even as in a tumour or polypus, but by the effusion of coagulable lymph from inflammation of the lining membrane. This forms successive layers over the surface of the dead ovum, giving it eventually a great degree of consolidation. Some of these masses when cut into, have no cavity; but the chorion and amnion are demonstrable, although the enveloping lymph may be one or two inches in thickness. It seems somewhat surprising, that the coverings of the fœtus, should be carefully constructed when there is no embryo. But the fact is so. Lately, I was present at the expulsion, after much previous flooding, of a firm, fleshy mass, equalling in size a large orange. The small central cavity was lined by a smooth and perfectly formed amnion, with a little fluid; but, although I examined the specimen under water most carefully, I could detect no appearance either of an embryo or umbilical cord. If in such instances the embryo has never been formed, they may be regarded as genuine examples of false conception. Some physiologists, however, have supposed that in these cases, the tender germ may have been accidentally and early deprived of life, and subsequently dissolved in the liquor amnii. However explained, the absence of the embryo is thus certified."

Of Moles which do not owe their existence to Conception.—The author has twice seen fibrous clots, the product of dysmenorrhœa, growing into mole, not expelled till they had attained a considerable size, and then only with great pain and serious hæmorrhage. The following case we give in Dr. Ashwell's own words:

"Some years ago, I was asked by Dr. Hodgkin to visit a lady a few miles from town, who was thought to have polypus. On examination, a fleshy and tolerably firm body could be touched just within the cavity of the cervix uteri, there had been considerable bleeding, and the anæmia was distressing. Ergot was given, and in a few days the mass was protruded through the os. A ligature was placed around it, which in twelve hours cut through, bringing away the tumour, but not without considerable hæmorrhage. Ergot was again exhibited, forty minims of the tincture every quarter of an hour, and after the sixth dose, a fibrous mass, as large as a turkey's egg, of firmly coagulated, and partially organized blood, was expelled. In six or seven weeks another mass, only smaller, was got rid of in the same way. This lady had long suffered from dysmenorrhœa, and had frequently passed firm concrete clots of lymph and blood. There had been no sexual intercourse for eighteen months prior to this occurrence. She afterwards died: dropsy of the chest and abdomen having supervened."

Vesicular Moles or Hydatids of the Uterus.—We are tempted to inquire why these products are not classed amongst the moles that are dependent on pregnancy. We can scarcely believe, even on Dr. Ashwell's high autho-

[redacted]

rity, that these vesicles ever originate merely in diseased action of the lining membrane of the uterus: certainly the chorion to which they are attached, and from which as a root they grow, can only exist as the product of conception. The chorion, unlike the decidua, is an entirely fœtal production, and we are therefore constrained to believe, that these vesicular hydatids, invariably found in connection with it, must be fœtal, also; or rather the blighted remains of the embryo. But Dr. Ashwell shall speak for himself.

"*Pathology.*—These formations are placed in the second species of moles, because I have seen at least one example where they were the result of diseased action of the uterine lining membrane, independently of sexual intercourse. The patient was the widow of a surgeon, and of undoubted reputation. Her husband had been dead two years and a half when the abdomen began to enlarge. She had nausea, but no vomiting, from which she had always suffered in her pregnancies. The increase of size was very rapid, and at three months and a half from the first stoppage of menstruation, the bulk of the uterus had reached that of a seven months' pregnancy. The abdominal tumour was flaccid, and the os closed. At the fourth month, after more than ordinary exertion, there was a gush of blood from the vagina, followed by the immediate escape of a considerable quantity of vesicular hydatids.

"The recovery was good. Iron was afterwards given, she was sent to the seaside, and now, at the expiration of several years, there has been no return of the malady.

"Mr. Douglas Fox, surgeon to the Derbyshire Infirmary, gave me the particulars of a case where a large mass of vesicular hydatids was expelled from the uterus of a maiden lady, where the hymen was unruptured, and of whose chastity there could not be a suspicion.

"Sir Charles Clarke and Dr. Blundell unite in opinion, that conception is not a necessary condition; while Madame Boivin, Capuron, Duges, and even our own countrymen, Denman and Burns, have arrived at an opposite conclusion. Dr. Evory Kennedy says, that 'hydatids may occur in virgins'; while Dr. Montgomery believes, 'that they invariably result from impregnation.' It were to be wished that every disputed physiological point admitted, as this does, of a settlement by the observation of facts.

"Women are liable to a repetition of this vesicular formation, where it has resulted from conception. The few exceptions, where the hydatids have formed independently of pregnancy, forbid at present any decided opinion as to the probability of their recurrence."

We regret, that want of space compels us to pass over several chapters of great practical value, especially the long and most able section on the various displacements of the uterus: in future editions we shall remedy this omission. At present we must content ourselves by a long extract, in every word of which we agree, on the now fashionable and frequently entirely unwarrantable operation of ovariotomy. We are truly glad, that Dr. Ashwell has given to the profession this most temperate and accurate opinion, and has thus thrown the weight of his great experience and reputation into the scale against this most formidable and unsuccessful operation. We prognosticate that, like extirpation of the uterus, in a few years extirpation of the ovary will be scarcely heard of, except as a matter of medical history.

"The progress and termination of encysted ovarian dropsy, have become subjects of the deepest interest, owing to the efforts lately made to cure the disease by extirpation. Whether this be a desirable, or even a defensible operation, must mainly depend on the known course of the disease, when either left to itself or treated with a view to palliation only. If it could be proved, in the majority of

cases, that the malady did not shorten life nor induce severe suffering, few more operations would be undertaken. But the examples of this kind are, it is to be feared, only exceptional; and yet I cannot divest myself of the idea, if our records were accurately kept, that a more favourable view might be correctly taken of the palliative, or indeed of any treatment which did not involve the necessity for this hazardous extirpation. Certain it is, that *many* women have lived to old agè, who were the subjects of the disease; and although a less number comparatively survive many years after tapping has become necessary, yet a collection even of these would go far to prove, that paracentesis is not by any means so fatal in this respect as has been supposed. Sabatier examined the bodies of several women who had carried these encysted tumours during half a century, without alarming derangement of health; and the memoirs of the French Academy of Surgeons prove, that it may last 58 years; while Nauche, as a summary of his own views, says, 'dropsy of the ovary, then, is not a very alarming disease, unless it be very ancient and very voluminous.' The cases of frequent tapping recorded by Martineau, Portal, and many other surgeons, amply attest the protracted duration of life in association even with this stage of the affection. Nor, in a calculation of this kind, must it be forgotten that numerous women have become pregnant, and have been many times safely delivered, notwithstanding a dropsy of one of the ovaries. Such cases have fallen under my own observation, and I could add others also where the malady, although of a considerable size, has existed many years without tapping, and without indeed any other than mere palliative treatment.

"These considerations are entitled to great weight when determining the propriety of extirpation, uncalled for by present and great evils; or where the operation, from the enthusiastic views of its patrons, is urgently recommended as a preventive of mischiefs which they deem, but not always on good grounds, to be prospectively inevitable. To operate, where the patient strongly desires it, from a conviction that her sufferings and the frequent repetitions of paracentesis, will otherwise prove speedily fatal, may not involve any distressing responsibility, especially where the condition of the tumour leads to the supposition, that the case is pathologically a favourable one. But there are examples selected for operation far different from this. Take, for instance, a case which occurred to me a few months ago. A lady travelled to town from a considerable distance, anxious to have extirpation performed. On inquiry, I found she was 62 years of age, had never been tapped, although ovarian dropsy had existed for more than half her life. There was scarcely any suffering beyond weight and pressure, although the tumour was of immense size and partly solid. In such a case, it would have been highly culpable to have operated; and yet a surgeon, over-zealous about the removal of ovaries, had induced the firm belief that it ought to be done. I need scarcely add, that the patient, after being made acquainted with the great danger of the operation, was perfectly satisfied to remain as she was. Nor will the practitioner be less perplexed and distressed by such a case as the following, which occurred within my observation not long since:—A young woman, under 22, had ovarian dropsy; her countenance bespeaking excellent health, and her history confirming the impression. Without interference, many years might have been added to her existence; and as one of the fortunate incidents of life, it might have so happened that the tumour should cease to grow. But unhappily she was convinced that extirpation was proper; the operation was most ably performed, and in a few days she died. These certainly are not the cases in which removal ought to be practised. If the operation is to become established, of which I have the strongest doubt, it must be confined to examples of the malady where tapping has already been so often performed as to preclude, from the experience of similar cases, any idea that it can ever be dispensed with; and where, we are confident, that great suffering must lead to early death. Perhaps this may be regarded as too limited a view of the value of extirpation, but it is, I think, the correct one. In such cases, if the diagnosis excludes the belief that there are—

serious adhesions, or malignant and solid growths complicating the tumour, and if the patient strongly desires it, the operation is defensible. In all other examples, it can only rest on the patient's own views of her future prospects, and on a calculation of chances. She might live many years and without much suffering; but she may die in a few years after great suffering; she determines, therefore, being courageous, and probably strongly urged by her surgeon, to run the risk of immediate death for the hope of immediate and radical cure. Whether she has done wisely to submit to such a hazard, a successful operation can scarcely prove; that she has happily secured her safety, through imminent peril, such an operation does prove. Lithotomy, operations for hernia, and for securing large arteries, rest on different grounds. That they are essential to the patient's life, is a full justification of their performance; for in all, even if not dangerous at the moment, it is certainly known that life will soon be destroyed, either by fever, gangrene, or loss of blood. Such, it has been proved, has not been the case in many of the fatal operations lately performed for extirpation of ovarian encysted tumours. It does not appear that statistics more favourable even than we have any right to expect, will materially change the aspect of the circumstances under which this operation is to be performed. It must, probably, from the impossibility of determining the real character and adhesions of the growth, ever remain an eminently uncertain operation. The extirpation, we are assured, by the operators themselves, in a fit case, is far from difficult—would that it were more so—for then it would not be so readily undertaken. If it required as much surgical knowledge and skill to make these large and brilliant abdominal incisions, as to tie the subclavian artery or to perform a trying operation of lithotomy, the lives of many women would have been already spared, and fewer would be sacrificed for the future. What would be thought of the feasibility of any other operation involving life in the most imminent hazard, if we discovered that out of 67 cases where it had been attempted, it was, *from absolute error of diagnosis, incapable of completion in eighteen*; that of the remaining 49 patients, where the extirpation was effected, *sixteen died* and two *were not cured*; so that out of the whole number 67, *the operation failed in thirty-six and succeeded in thirty-one*, less than one-half. Such results are distressing, especially when we hear no greater doubt expressed about the operation itself, but only higher confidence in its value, and greater laudation of the operators. We willingly concede presence of mind and ability to many of the extirpators of ovarian cysts; but we are unable to discover (for the later operations have been quite as unsuccessful from unfitness of the cases as the earlier ones) that any advance has been made in diagnosis. Nor, when the tumours themselves are examined after death, when the malignancy of many of them is recognised, and their firm, almost indivisible adhesions, and their immovable masses of new and morbid substance are brought to view; it is next to impossible to entertain any sanguine hope, that our means of diagnosis can ever be much improved."

In concluding our still imperfect analysis, we must, in justice to the author, declare our conviction, that his work on female diseases is the most able, and certainly the most standard and practical, we have yet seen. It will, now that it is completed, find its way into the library of every practitioner, and justly confer on its talented author a very high place in the first class of obstetric physicians.

Nor can we close these critical remarks, without congratulating Dr. Ashwell, that even his unfinished book should have received from our utilitarian and clear-sighted brethren in America the high compliment, not merely of republication for sale, but of an extensive reprint for private circulation, amongst the members of the largest Medical Society in the United States: Dr. Hall, the Secretary, remarking, "that it may afford Dr. Ashwell some gratification to know, that his labours are appreciated on

this side of the Atlantic, and are conferring a special benefit on six or seven hundred physicians in Massachusetts."

ON THE CHANGES INDUCED IN THE SITUATION AND STRUCTURE OF THE INTERNAL ORGANS UNDER VARYING CIRCUMSTANCES OF HEALTH AND DISEASE, AND ON THE NATURE AND EXTERNAL INDICATIONS OF THESE CHANGES. By *Francis Sibson*. Worcester, 1844. Octavo, pp. 270.

THE present work formed one of the principal contributions to the twelfth volume of the "Transactions of the Provincial Medical and Surgical Association;" and reflects great credit upon its author, Mr. Sibson, resident medical officer at the Nottingham General Hospital. The post of resident at a well-conducted hospital offers to a man of talent and industry excellent opportunities for the pursuit of pathological investigations; but the emolument attached to it is generally so insufficient as to induce gentlemen who accept it, at least those of them whose acquirements would enable them to turn its opportunities to advantage, to retain it only until something better can be found, and consequently for too brief a period to admit of the prolonged pursuit and reiterated examination of any important or novel subject of inquiry. This is much to be regretted: for, the place of ardent, well-educated inquirers of this description can in no wise be supplied by the active medical officers, whose time is occupied and attention distracted by the cares of private practice, and who are for the same reason not always so perfectly in possession of a knowledge of the most recent advances in physiological and pathological science, as he who has just quitted the sources of its diffusion; and the consequence is, that a most important field of research lies comparatively uncultivated.

We will state the object of Mr. Sibson's publication in his own words.

"It is now some years since I found that my notions of the usual and healthy sites of the various viscera were ill defined. To clear up this obscurity, owing to which I was constantly at fault in examining patients suffering from chest diseases, I took diagrams of the position of the viscera, when making *post-mortem* examinations of the patients that died in the General Hospital near Nottingham. I first drew a careful outline of the ribs and sternum, and then added the internal viscera, taking care that their bearings to each other, and the ribs, were accurately planned.

"After a time I procured a frame, and stretched strings across and along it, at distances from each other of three inches; the whole frame was thus subdivided into 45 squares. I ruled a piece of paper with squares of a like fashion, but of one-third the size: the frame I laid over the subject to be copied, and with care and accuracy traced the objects that were behind each three-inch square upon the corresponding one-inch square on the paper.

"I showed these diagrams, from time to time, to Dr. Hodgkin: he was interested in them, said they were of value, and gave me many important hints respecting them. Last winter, Dr. Hodgkin exhibited and explained many of the diagrams at one of the conversaziones at St. Thomas's Hospital, at the time when the medical school of that Institution had the advantage of his services. Some months before these diagrams were thus brought before the profession, Dr. Hodgkin suggested to me a plan for taking them, which I immediately

adopted—a plan that placed my inquiry on an entirely new and more solid footing. This method consists in drawing the outlines of the organs on a piece of lace, stretched on a frame and placed over the body; the sketch is transferred by placing the lace over a sheet of paper, a piece of the manifold letter-writer paper being interposed. By pressing firmly with a point on the chalked outlines, they are traced in black on the paper beneath. By this plan, employed with care, perfect accuracy is ensured. It has the advantage also of being applicable to the living as well as to the dead.

"To reduce these full-sized diagrams to their present dimensions, I employed a pentagraph that was recommended to me by Dr. Hodgkin.

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"I possess, including those engraved in this paper, 79 diagrams of the internal viscera, taken from the dead, and 85 from the living subject. I have likewise records, in a tabulated form, of the relative position of the various viscera, as ascertained by percussion and auscultation, in 88 persons of both sexes, and of various ages, occupations, and residences, in almost all of whom the heart and lungs were healthy. In 66 of these cases I have minute notices of the form of the surface, as indicative of the viscera underneath; of the respiratory sounds over the larynx, and over different parts of the chest, in tranquil and in forced respiration; of the nature of the heart's sounds over the region of the heart's superficial dulness, the course of the great vessels, and the general surface of the chest; and of the seat of the heart's impulse. The results of the scrutiny of these materials are detailed in the preceding pages."

About forty of these diagrams are here engraved, illustrating the normal situations of the various thoracic and abdominal organs, and the variations these undergo in consequence of the presence of the different diseases of the chest. They form, as the author observes, not merely illustrations of the present essay, but also of the works of Laennec and his successors, and will therefore prove of value to any one engaged in the study of any of these. The Essay itself consists of a detailed description of the position of each organ under the circumstances of health and disease, and of the varieties which occur in this respect during the different acts of the process of respiration. The diseases of the chest are treated of at considerable length under the heads—1st. Of Diseases where the bulk of both lungs is enlarged, as *Emphysema* and *Bronchitis*. 2d. Diseases where one organ and one side of the chest are enlarged, as *Pneumonia, Pleuritis*, and *Diffused Tuberculous Consolidation*. 3d. Diseases in which the bulk of the affected lung is lessened, as *Phthisis*. 4th. The Heart and its Diseases.

The work is so completely one of reference for the subject to which it relates, that an analysis of its contents is uncalled for, and would be scarce intelligible condensed into the space we have at command. We will therefore content ourselves by extracting a few passages.

Effects of Respiration on Jugular Pulsation.—"The veins of the neck contain the least blood during a deep inspiration, the expansion of the walls of the chest withdraws the pressure of those walls from the right cavities of the heart, and permits the blood to be sent more freely into those cavities. The venous pulsation is much diminished, in many persons rendered invisible, during a deep inspiration. A forcible and deep expiration has, on the other hand, quite an opposite effect; the contracted walls of the chest compress the right cavities of the heart, and prevent the ingress of venous blood. The veins of the neck and of the thyroid body become necessarily distended; these veins indeed become an ever-varying reservoir, which adapts itself with perfect flexibility to the expansion or contraction of the heart, so that, when the cavity inside is lessened, the reservoir

outside is enlarged. During the deep inspiration, provided the swelling of the veins be not extreme, the venous pulsation is increased: if the veins become completely distended, pulsation cannot, does not take place; the constant full distention does not admit of variation. The venous pulsation is readily distinguished in the recumbent posture during ordinary inspiration. Each inspiration lessens the quantity of blood in the veins, each expiration increases it; so that here, in the act of respiration, we have a cause for another venous pulsation more. The mere jugular pulsation is any thing but an indication of disease, either in the pulmonary valves or elsewhere. In those diseases where the flow of the blood through the lungs and heart is impeded, the jugular veins contain more blood, and their pulsations are more visible than in health; but where the impediment is extreme, the veins are in a state of constant distention, and no pulsation is visible. If, on the other hand, the circulation be feeble, and there is no resistance to the emptying of the venous blood into the heart, then the veins contain very little blood, and the venous pulsation is very slight, scarcely to be perceived."

Respiratory Movements in Children.—"In children, when compared with adults, the costal cartilages and sternum are very flexible. The inferior margins of the lungs are lower, being usually behind the sixth costal cartilage or sixth intercostal space; the liver is much larger, and the stomach and bowels are more distended in comparison with the size of the lungs; consequently the abdomen is more protruding, the seventh, eighth, ninth, and tenth ribs and their cartilages project more to the side, and the epigastrium and xyphoid cartilage are more prominent. The abdomen is greatly more developed than the chest; consequently, the precise lower margin of the lung and upper bound of the liver and stomach, where they lay behind the ribs and epigastrium, are very apparent, the latter bulging forward suddenly, while the former generally falls in a little from the prominence over the superior costal cartilages. On a deep inspiration the descent of the diaphragm pushes down the liver and stomach, and draws the lungs down to the place previously occupied by these organs. The lungs descend to the seventh rib or sixth intercostal space, and the chest becomes narrower, after which the comparatively small lungs replace the more bulky liver and stomach. The xyphoid cartilage and the seventh and eighth ribs fall in, being pressed back by the weight of the atmosphere, and the edges of the opposed sixth and seventh costal cartilages approach each other."

The paintings of the great masters faithfully portray the great proportional abdominal development of children, and the distinctness of the boundaries between the thoracic and abdominal organs. The sternum is prominent at its upper portion in the region of the thymus, but falls in rather suddenly below. The costal cartilages, especially the third, fourth, fifth and sixth, are more prominent than the sternum, the bulging forward of the heart and lung coinciding with these prominences, which are most considerable on the left side. The liver and stomach push forward the lower costal cartilages and distend the abdomen between the eleventh rib and crest of the ilium. As the child grows older, the disproportion between the abdominal and thoracic viscera becomes less, and the depression indicating their boundaries is less marked. At eleven or twelve the upper part of the chest and middle of the abdomen are about equally prominent. The measurement over the lower margin of the lung is in children greater in comparison with that around the chest under the axilla; and the measurement of the abdomen near the lower edge of the costal cartilages is still greater than that over the lower margins of the lung. These relative admeasurements alter as the child grows up, and at about the age of six the measurements over the axilla, over the lower margin of the lungs, and

over the lowest rib, are nearly equal. There is little difference between the two sides. About the age of eleven or twelve, the difference of sex and habits of life begins to tell.

Emphysema.—The author concludes an elaborate exposure of the changes produced in the form of the chest by this disease, and of the physical signs by which it is recognised with this passage :

"Emphysema is scarcely, I conceive, a distinct disease, but is one of the morbid conditions resulting from other diseases, or from repeated excessive inspirations excited by continuous labour. It is, I conceive, the result of repeated, irresistible, forcible, and vain attempts on the part of the patient to make up by deep inspirations for the deficiency in the arterialization of his blood ; and of the difficulty in expelling the air from the already dilated cells through the narrow outlets. All the cases of emphysema that I have examined with care, have sprung from bronchitis, exposure to cold, damp, or disease of the heart. In all those cases that originated in bronchitis, the skin was soft, loose textured, perspirable, and susceptible of the influence of cold."

Bronchitis.—"The diseased vascular action, and the diseased mucus coating of the vascular surface, interfere with the arterialization of the blood. The patient is necessitated to inspire deeply and frequently, and, in time, the whole volume of the lungs becomes permanently enlarged. The whole outline of the chest, the diaphragm, and the relative seat of all the organs, present the characters of a constant deep inspiration, though not nearly to the same extent as in emphysema. Everything that has been said with regard to the position and form of parts in emphysema applies, though in a modified degree, to bronchitis. The former disease, emphysema, is only a necessary carrying out—an unavoidable development—of the latter disease, bronchitis. In bronchitis, the base of the lungs and the heart are much lowered; the impulse of the heart is generally in the epigastrium. The liver and abdominal organs are thrust down in like manner, though not to a like extent, as in emphysema. The extent to which the bronchitis has caused the lungs to dilate may, in the earlier stages, be invariably, and in the latter, generally, ascertained by comparing the seat of the depression, marking the site of the lower margin of the lung in the healthy state, with the present diseased site of that margin. A variable measure of the extent and severity of the disease is thus supplied us."

After describing the microscopic changes observed in the structure of the lung suffering from *Pneumonia*, Mr. Sibson states that the *capillary branches of the pulmonary artery and vein are the primary seat of the disease.*

"The coats of the artery are changed in structure and texture by a diseased modification in their cell life ; they are at first too soft and yielding. The heart's force, through the medium of the blood, thrusts aside and dilates the softened walls, stretches, and lengthens them. At a later period, new material is formed within the vessels, which blocks up the affected capillaries. Parallel with this change is another going on in the capillaries of the same lung, but not in the same diseased part. The inner walls of the diseased capillaries thicken and approach each other, gradually lessening the calibre of the tubes, and at length meet, so as to close the capillaries; ultimately, all the capillaries become obstructed, and, at an advanced stage, destroyed. The air-cells are essentially and in form, subdivisions of the capillaries of the pulmonary artery and re-meetings in those of the pulmonary vein, each filamentous wall consists of a single vessel, and each related webbed wall consists of the interlaced capillary branches of that vessel. The bronchial tubes and the walls of the arteries themselves, are thickened and rendered fibrous by the new diseased vascularity."

We will conclude our extracts with the author's statement of the *relative dimensions of the auricles, ventricles, and great vessels.*

"During the years 1835 and 1836 I measured the valvular communications and great vessels of the heart. By inserting a graduated cone into the vessels or outlets, I ascertained their respective diameters. After a time I injected the cavities of the heart with plaster of Paris: when the plaster had hardened I cut out the casts of the cavities thus formed: I dipped each of the casts into water, noticing how much water the cast of each auricle, and of each ventricle displaced: I also measured the dimensions of the various vessels and communications. I did not arrive at a perfectly accurate estimate of the relative proportion of the cavities, and their outlets and inlets, by these means; but, as an approximation, I venture to submit the subjoined statements.

"In a girl, 14 years old, both cavities of the heart were enlarged: the injection distended the left cavities as completely as the right. The casts of the right and left ventricles each contained the same quantity of fluid, viz. 3 oz. and 6 drachms. That of the left auricle displaced 2 oz. and 6 drachms. If this example be a fair criterion, and I think it is, it may be stated that each ventricle contains, when distended, the same amount of fluid. If the ventricles empty themselves completely during their contraction, they must each hold the same quantity of blood. In the average of contractions, the same quantity of blood that is sent from the left ventricle must have been sent to it by the right ventricle, during an equal number of pulsations. During an inspiration the right ventricle receives and sends forth more blood than the left. During an expiration the left ventricle discharges more blood into the system than the right does into the lungs. But the two ventricles balance each other exactly, in the course of 6 or 7 beats, of 2 or 3 inspirations.

"The right auricle and right ventricle contain about an equal quantity of blood. The left auricle holds about three-fourths less blood than the left ventricle.

"In the heart just referred to

The pulmonary artery was - -	$\frac{6}{10}$ of an inch in	diameter.
Each pulmonary vein was about -	$\frac{1}{2}$ of an inch	ditto
The aorta was - - - -	$\frac{65}{100}$ of an inch	ditto
The superior cava was - - -	$\frac{7}{10}$ of an inch	ditto
The inferior cava was - - -	1 inch	ditto

"The communication between the right cavities had a long diameter of 1 inch and $\frac{3}{10}$; but as this opening is irregularly oval, its area is not expressed by its diameter. Perhaps its area was $\frac{4}{5}$ of the area of a circle of the same diameter. The same remark applies to the left auriculo-ventricular opening, whose long diameter was about 1 inch and $\frac{3}{10}$. The area of this opening was, perhaps, $\frac{4}{5}$ of the area of a circle of like diameter.

"About 16 inches of the aorta would hold the contents of the right or left ventricle;
About 12 inches of the pulmonary artery,
About 9½ or 10 inches of the combined pulmonary veins,
About 7 or 7½ inches of the combined venæ cavæ,
About 8 or 8½ inches of a tube, the calibre of the right auriculo-ventricular communication, and
About 8½ or 9 inches of a tube the calibre of the left auriculo-ventricular communication, would hold the contents of either ventricle."

We repeat, this book does great credit to the industry of its author: and will prove a useful companion during the perusal of any of our modern treatises on Diseases of the Chest.

Relation Medicale de Campagnes et Voyages de 1815 a 1840, &c. Par M. le *Baron Larrey*. 8vo. pp. 412. Paris. Bailliere.

No work from the pen of Larrey—the surgeon of a hundred fights—can be devoid of more than usual interest. His vast experience and the practical turn of his ever-active intelligent mind, give a force to all his precepts and remarks beyond what we are willing to concede to the majority of writers in these days. Not but that he is too apt to exaggerate the importance of his own views, and depreciate and talk slightingly of whatsoever differs from them; but, despite this very palpable blemish, his writings deserve to be generally known, inculcating, as they do, much that is sound in theory and valuable in practice.

The present volume gives us a rapid review of the closing scenes of his long and memorable career. It has been published upwards of two years; but has hitherto escaped our notice until very recently. The delay, however, is not of much consequence; and we therefore gladly take this opportunity of making our readers acquainted with its contents, and of elivening the *tædium* of purely professional discourse with the amusing anecdotes of an old campaigner's note book.

In the four volumes of the "Memoires de Chirurgie Militaire et Campagnes," *Larrey* has given a most graphic and instructive description of the leading events of his chequered life, by flood and field, from the year (1787) when he started as assistant-surgeon in the French navy, down to the first capitulation of Paris in 1814. It is therefore with the view of completing his professional biography that he has brought out the volume which we now propose to consider. The following summary of its contents is given, as nearly as possible, in the author's own words, that the narrative may lose nothing of the amusing gossip of the original.

On my return from the grand army at Fontainebleau, a few days before the departure of Napoleon for Elba, I resumed my very responsible duties as Inspector General of the medical department, and Surgeon of the Imperial Guard. I had proposed to His Majesty to accompany him to the place of his exile; but he graciously refused my offer, saying, "You belong to the army, and you must follow it; it is not without regret that I part from you, M. *Larrey*."

My health at this period had suffered much from the cruel vicissitudes which we had met with in the terrible campaigns of Russia, Saxony and France. as well as from the chagrin I felt at the banishment of the Emperor. For a length of time I was the prey of a gloomy melancholy. which might perhaps have ended fatally, but for the hope I still cherished of seeing once more my illustrious protector. I had indeed formed the project of visiting him in his island, when the unexpected news of his debarkation in France arrived at Paris. He reached Paris on the 20th March; and one of his first acts, on taking possession of the Tuilleries, was to summon me to his presence. Alluding to his having left me without fortune, he animated my heart with these words: "Continue your labours. M *Larrey*, and I yet hope to be able to recompense the sacrifices which you have made and the services which you have rendered to our wounded."

While all was bustle and activity in the metropolis in effecting the re-organization of the army, steps were taken for holding the *fete* of the Champ-de-Mai—a very unnecessary and uncalled-for ceremony under the then existing circumstances. But this, like many other inconsiderate acts of that period, was suggested to the Emperor by the secret triumvirate which had already conspired for his final overthrow. It was about this time that he addressed the Deputies of the department of the Hautes-Pyrenées in the following language, when he presented the new tri-colour flags to the different regiments: "Gentlemen, I am pleased to have the opportunity of sending you this flag by your compatriot *Larrey*, who adorns humanity by his bravery and disinterestedness: he has saved a great many of our soldiers in the deserts of Lybia, by sharing with them his little stock of water and spirit, which he needed so much for himself."

As my colleague, Baron *Percy*, had contrived to supersede me at head-quarters as first surgeon of the grand army, I had made up my mind to retire from active duty and devote my time to arranging the materials for the fourth volume of my surgical narrative, when Count *Drouot* waited upon me to invite me, in the name of the Emperor, to accompany him in his campaign, and direct the *ambulances* of the guard. I could not resist the appeal, and at once prepared to depart. We left Paris on the 9th of June; but—at least in my own case—not with those feelings of confidence that used to animate me in all our former expeditions. My mind was haunted with the presentiment that this campaign would prove disastrous to France. The sight of one of our grenadiers, on the evening of our first day's march, stretched out in a corn-field by the wayside, with his head shattered to pieces, added to the gloom of my ideas, and it was not without the worst forebodings that I continued my route towards the frontier.

On the 16th we fought the battle of Fleurus (Ligny)—the scene of Marshal *Jourdan's* famous victory in the days of the Republic. The result was not decisive; either from our not profiting, to the full extent, from the advantage gained, or from the Emperor being diverted from following up his success with his usual promptitude and decision by persons around him who were interested in his overthrow. While our army rested for twenty-four hours after this conflict, the enemy was enabled to rally their forces and resume an advantageous position. On the morning of the 18th, they were discovered along the line of Waterloo. The battle on this field had not long been joined, before the Prussian and English columns gave signs of confusion and retreat; but, at this time, torrents of rain came down and materially impeded the operations of our artillery, the ground becoming so soft and miry that our gun carriages could not be moved. The agents of the traitors that existed in our own army, as well as of the enemy's officers, taking advantage of this *contre-temps*, spread themselves among the ranks, calling out to the artillerymen, "Save yourselves who can; cut the traces of the horses and be off, for you are surrounded on every side by the columns of the enemy." An eye-witness of these treacheries, I longed to acquaint the Emperor of them; but the wounded on every hand were calling out for my assistance; and, in addition to this imperative duty, I had to look after my *ambulances*. The enemy's cavalry now made repeated and most destructive charges upon our lines, and their daring was not a little increased by their knowing full well that ours

were at a distance from the scene of action. Marshal *Grouchy*, with his 30,000 troops, had remained at a distance from the main-body of our army, which had consequently to resist the entire combined forces of the coalition. The disorder therefore increased more and more; and the wounded came in so fast to us on all hands, that, in spite of our best zeal and courage, our efforts were paralyzed, either from the charges of the English cavalry reaching even to our *ambulances*, or because we were deprived of the light of day. We were therefore forced to join in the retreat which our army had begun to execute, according to the instructions which I had received from the Emperor by an aide-de-camp, to gain the frontier by a cross-road that was pointed out to us. We had not proceeded above two or three leagues when, in the dark, we were overtaken by a troop of the Prussian lancers. I was marching, at the time, at the head of my small company, and, feeling convinced that our assailants were not numerous, I did not hesitate, sword in hand, to force my way through them. Discharging my two pistols, I made an opening, through which my companions and servant passed, and galloping off at full speed, contrived to gain the open plain. My horse being wounded, fell; and at the same moment I received a sabre blow upon my head and left shoulder, which brought me senseless to the ground. The troopers rode after my companions, and overtook them. Meanwhile, having gradually recovered my consciousness, I got up, mounted my horse, which had by this time revived considerably, and made my escape through the corn-fields, directing my course towards the frontier. Next morning, by the break of day, I reached the banks of the Sambre, and was immediately made prisoner by the enemy's cavalry. The soldiers treated me very badly; for they stripped me not only of my arms, watch, and all my cash, but also of my very clothes. My height, and the gray great-coat which I wore, made them mistake me for the Emperor; and, under this idea, I was conveyed without delay, handbound, to the Prussian general in command of the advance guard. He soon discovered the error; and, in a fit of fury, determined to have me shot. But at the moment when the soldiers were ready to shoot me in the head, (faire feu sur ma tete,) the surgeon of the regiment recognized me, and prevented the execution of this barbarous order. I was forthwith taken before General *Bulow*, who knew me, and had compassion on my miserable condition; for at this time, besides being barefoot and having scarcely withal to cover my nakedness, my hands were tied behind my back, and my head was covered with bloody rags. When Marshal *Blucher*—to whom my name was well known, as I had saved the life of his son who had been wounded and taken prisoner in one of the Austrian campaigns—heard of my state, he treated me with great generosity, and sent me on with one of his aides-de-camp, to Louvain, where I was lodged in the house of a poor widow. A young *officier de santé* was summoned to dress my wounds. He at once recognised who I was, exclaiming, "You are Baron Larrey;" and forthwith, before I had time to answer him, he hurried down the stairs and disappeared. He had gone to announce my name to the municipality of the town, and to obtain, if possible, better accommodation for me. In a very short time my young medical friend, accompanied by one of the civic officers, came back; and I was conveyed in a carriage to the house of

M. *Yonk*, a distinguished advocate, from whom I received all manner of kindness. Every where the Belgians appeared to sympathize in heart and feelings with the French, and, I doubt not, they very sincerely regret that they have not been rejoined to this great family.

After a few days' care and quietude, I was able to visit some of the hospitals into which many of our wounded soldiers had been admitted.—At this time, I was much too weak to operate myself; but I assisted with my advice the Belgian surgeons in the performance of their arduous and responsible duties; their zeal and intelligence merit my warmest praise.

From Louvain I passed on to Brussels, where the English had established their hospitals. During the first few days after the terrible battle that had been fought on the adjacent field, it had not been possible to class or arrange the wounded of the different nations; and hence they were all confusedly mingled together. Most of the French however were in the military hospital of the town, under the immediate care of my old fellow-labourer, Dr. *Seutin*. We performed together a number of operations, most of which terminated very favourably. Occasionally I visited the English hospitals, and consulted with the surgeons on the more difficult cases. There was one case that I took especial interest in, and which merits a short notice here. A French soldier had his right thigh so terribly disorganized by a cannon-ball, that the only chance of saving the poor fellow's life was by amputating the limb at the hip-joint. This formidable operation was successfully performed by Mr. *Guthrie*, and the man is now an inmate of the Hôtel des Invalides.

I obtained permission from the allied officers to return to my family; and straightway I set out for Paris, where I arrived on the 15th of August. All the barriers and military posts of this city I found occupied with foreign troops—a woful sight to one whose soul was already so deeply wounded by personal misfortunes. New troubles awaited me! Regarded as one of the most zealous partizans of *Napoleon*, I had been deprived of my office as inspector-general of the army, and of all its emoluments. Besides this loss, I ceased to receive any pay as member of the Legion of Honour. My family too was *oberée* by having foreign soldiers billeted upon them, so that altogether my ruin appeared to be complete.

But even then I was not without some prospects of advantage. Not only was I solicited to pass over to the United States, but an offer of rank and high responsibility in his army was made to me by the *Emperor Alexander*. *Don Pedro* of Brazil also wished to engage my services for his army and as professor of surgery in the University of Rio-Janeiro. But I was resolved not to expatriate myself, although exposed both to distress and even danger during the counter-revolution that was secretly at work during the years of 1816 and 17. On the following year, the pension of 3000 francs—which *Napoleon* had bestowed on me for my services after the battles of Wagram, Lutzen, Bautzen, &c.—was restored to me by a decree of the Chambers. By this act of grace, my difficulties were considerably relieved, and I was enabled to carry on the publication of the fourth volume of my *Relation*, which was received with much favour by the public.

In 1822 the news of the death of the Emperor overwhelmed me with affliction, and, partly with the view of drawing my mind away from melan-

choly recollections, I commenced a work on Clinical Surgery, which I had been contemplating for some time. Before, however, completing it, I resolved to pay a visit to the hospitals in England—one of the most civilized nations of Europe, and where Surgery had made, of late years, such brilliant progress—to examine for myself the operative practice of the surgeons there, and compare it with our own. Another motive with me was to take my son Hippolyte, then 18 years of age, with me, in order that he might complete his knowledge of the English language; for I had been long convinced that nothing contributes so much to enlighten and expand the mind and stimulate it to exertion, as travelling.

Having obtained from the Minister of War official permission to go abroad, and retain, during my absence, *ma solde de traitement*, we started from Paris on the 26th of August, 1826. Passing through Rouen we proceeded to Havre, where among other sights, we visited a French frigate, which had just returned from the West Indies. I was much struck, and not a little pleased, with the great improvements that had been effected in the general economy of our ships of war since the year 1787 and 1788, when I served in the Royal Marines. The substitution of dry-rubbing of the timbers between decks for the use of the wet mop is of essential advantage to the health of the crew; and the preservation of the water in iron tanks in place of wooden casks has likewise been most beneficial. The water might be kept still sweeter than it is, if the tanks were lined with tin, and their walls were rubbed over with peroxide of manganese.

The clothing of the sailors, too, in the present day. has been much improved; the woollen shirt, that they wear next the skin, contributes much to the preservation of their health, alike in hot and in cold climates. The hammocks. also, are made much more comfortable than they used to be at the close of the last century.

Arriving at Portsmouth, the Baron went on board the Victory—*Nelson's* ship—with which he was quite delighted. His notice was especially drawn to the famous words—engraven in letters of gold on the quarter-deck—of the last signal made to the fleet on entering into action at Trafalgar: "*L'Angleterre devait s' attendre qu'aujourdhui, ici, chacun ferait son devoir.*" (How feeble, when compared with the original!)

He visited the Naval Hospital, and expresses his admiration of the arrangements, both medical and administrative, of its entire economy.

Journeying through the West of England, he first passed over to Dublin. the various medical institutions of which he examined with great care.

The following remarks, on the treatment of maniacal Insanity, seem to have been suggested by what he saw in the great Lunatic Asylum of that city. "In place of using cold *douche* baths, in which the water is made to fall from a considerable height on the shaved head of the patient—a method that is both painful and apt to induce hypertrophy of the cranium and engorgement of the cerebral membranes, a common cause of the incurability of insanity—I should advise the application of ice to the vertex. Bleeding, either general or local, should generally precede the adoption of this remedy. The subsequent use of revulsives and antispasmodics is often of much service." The Baron tells us, that his estimable Irish *confreres* received these, and all his other suggestions, with every mark of grateful respect, and promised to adopt them in their practice.

He comments, apparently in a spirit of disapproval, upon the custom, in this country, of applying the ligature to the femoral artery, in cases of popliteal aneurism, so high up in the thigh as two or three inches below Poupart's ligament; and, also, on the great unwillingness of British surgeons generally to have recourse to the use of the trephine in injuries of the skull.

The Foundling Hospital of Dublin is regarded by our traveller as altogether more beautiful and more admirably conducted than any similar establishment in Europe: *il fait honneur à la generosité et à la philantropie des administrateurs qui le gouvernent.* The Maternity Hospital also, of this metropolis, deserves the very highest praise.

Larrey, like every other visitor of Ireland, could not fail to remark the miserable condition of a vast proportion of the lower classes of the population. Their squalid unclothed condition is truly lamentable. Little is the wonder that Typhus fever is so prevalent and destructive in places that are unfortunately so well prepared for the development and spreading of this pestilence. The fever here is often accompanied with an erythematous exanthem, and sometimes even with carbuncular pustules, not unlike to what I had seen in plague-patients in Egypt. The treatment, continues our author, that was followed in this disease, appeared to me to be most rational, and on the whole very successful. Revulsive bleedings, from the nape of the neck and from the back, with the cupping instruments, and the internal use of etherial theriacal wine, of bark or quinine, and of lemonade, constituted the basis of the medication. I suggested, as a very efficacious remedy in all such cases, the application of the moxa near the basis of the cranium and on the epigastric region.

For opening the sympathetic or critical abscesses, that not unfrequently supervene in Typhoid patients, I advised the application of the actual cautery—the point of a knife heated to whiteness—or of the caustic potash, in preference to the use of the bistoury, that appeared to be used in this country on all occasions. I also proposed to my medical friends to extirpate the malignant pustules or carbuncles, and then to cauterize the wounds with the heated iron! This, like every other observation, was received with 'une grande modestie et d'un veritable interêt.'

The illustrious stranger met with similar attention from his professional brethren in Liverpool and Glasgow, to whom he pointed out the proper method of applying his unremovable apparatus for the cure of fractures—the treatment of which, among us, he considered to be decidedly faulty—and also the moxa, as improved by him.

Larrey arrived in London from the North on the 14th September. "We were," says he, "singularly astonished and almost awe-struck (effrayés) at the magnitude of this city." One of the first visits he paid was to Sir *Astley Cooper*, who, as we may well suppose, received his visitor with distinction and all the marks of a sincere fraternity. They drove together to Guy's, which, like all the other hospitals in England, is admirable for its cleanliness and excellent arrangement.

He then went to Chelsea Hospital, in order that he might compare the condition of its inmates with those of the Hôtel des Invalides: the latter he considered to be, on the whole, both better fed and better clothed than the former. The pensioners of the English army are lodged in small

apartments, separated from each other, and arranged like the cells of monks. We were agreeably surprised to see a plaster statue of Napoleon over the door of more than one of these. Sir *Everard Home* and Dr. *Somerville* paid all attention to their illustrious guest; the former presented him with a copy of his magnificent work on Comparative Anatomy.

In reference to what he saw at Chelsea and Greenwich Hospitals, the Baron makes the following remarks, inculpatory of English military surgery in reference to amputation. "We found in these establishments only a very few patients who had lost their limbs. One of the principal causes of this circumstance, as I had already observed during the course of the war, is the unsuccessful result of the amputations in the practice of the English surgeons—a result which appears to me to be attributable to the mode of operating and the plan of dressing the wound that are almost invariably followed. These processes consist in making the amputation, or rather the section of the muscles, *en un seul temps*, and in uniting the flaps of the wound too firmly together with the view of obtaining a cure by the first intention. A long experience has quite satisfied us of the disadvantages of such practice."

After inspecting the various medical institutions of the Metropolis, *Larrey* visited the British Museum, where "he saw with genuine pain and regret the precious and rare antique monuments which we (the French) had collected in Egypt, and which are figured and described in the great work commemorative of our brilliant expedition. The most remarkable of these monuments are the famous stone of Rosetta, on which is graven an inscription in four languages—the Hieroglyphic, the Coptic, the Arabic and the Greek—and the closed hand, in red granite, of the Memphian Colossus, which we found buried at a considerable depth in the soil of the ancient capital of Egypt. The first phalanx of the middle finger of this hand I measured at the time of our discovering it, and found it to be three feet long. Judge then the enormous state of the entire figure! Besides these, I saw many other curiosities which the English had taken from us at Alexandria."

The Baron expresses his regrets that the urgency of his duties prevented him from a longer sojourn in London. He had seen much to interest him, and he left with every feeling of gratitude and respect.

"I remarked with satisfaction," says he, "that the English surgeons perform their operations with perfect calmness of manner, and with great dexterity; they do not hurry or make a bustle with their instruments, as I have seen a good number of our distinguished surgeons do.

"I cannot give the same approbation to their plan of dressing the wounds after their operations. Their great aim and object seem to be to cause the solution of contiguity to disappear. The result of this over-anxiety is, that not only they bring together and place in exact apposition the edges of recent wounds, but they even treat old wounds and ulcers in the same manner.

"In general, it is a physiological error to believe that we abridge the labour of nature in the cicatrization of wounds, by bringing and retaining their surfaces into immediate contact with each other, when the wound is the result of amputation of a limb in its continuity. In this case it should be remembered, that all the tissues or organs are divided perpendicularly to the axis of the bone. However exact may be the union or apposition effected at the time of the first dressing, there must always remain at the bottom of the wound a cavity in which will

accumulate the fluids that continue for some time to ooze out from the open small vessels. In this manner, therefore, there can scarcely fail to be a more or less considerable effusion, the presence of which must necessarily prove injurious, on the one hand by the distention and tumefaction of the two flaps thereby occasioned, and on the other, by the absorption of a perhaps putrid matter into the circulation, and a consequent infection of the whole system. The presence of pus in the veins of an amputated limb is no proof of the vessels being inflamed; they are only the conductors of the morbid matter generated in the wound. Even the divided nerves become penetrated by the miasmatic principle, or by the carbonic acid developed in the purulent *foyers* that are formed in consequence of a sort of fermentation.

"When the tissues of an injured part are in a state of inflammation, they are not at all in an apt condition to unite; and the only way, in which they can become *degorged*, is by the process of suppuration being established."

Our author discourses for several pages on this subject of primary and secondary union of wounds after amputation.

"When the operation is performed for any chronic disease of the extremity, as for caries of the bones, white-swelling of the joints, or cancerous or other malignant degeneration of the soft parts, I consider it to be quite indispensable if we hope to prevent local engorgement and purulent infection, that the divided surfaces be not immediately united and kept together; so that the effused fluids may not be retained or forced back upon the system, but may ooze out from the wound as they are formed. Nearly the same remarks hold good in cases where a limb has been amputated for a recent injury. At least, such we have found to be the case in our own experience; and the surgeons of our army at the recent capture of the Citadel of Antwerp fully confirmed the truth of my remarks. In almost all the cases, the immediate union had been adopted at the first dressing of the stump; but, within 12 or 24 hours, the re-action which ensued was found to be so violent as to compel the surgeon to remove the bandages and plasters. On this being done, the unpleasant symptoms subsided; but in not a single instance was the healing complete before the 50th or 55th day after the operation. In the cases, on the other hand, that were treated on my principles, the wound had generally healed full three weeks sooner. In a very few instances, the exact and primary union took place, and the healing of the stump was very rapidly (*prematurement*) effected: but what usually happens then? The internal adhesion does not and cannot take place except by a sort of mere *recollement* or agglutination of the divided tissues, so that the vessels cannot be retained in such a mutual apposition as to anastomoze with each other, and the divided extremities of the nerves cannot unite together, end to end, as constantly happens when the treatment of the wound has been conducted on my principles, and according to the obvious intention of nature, which will never be violently thwarted by the intelligent surgeon. Moreover, the stumps, that are prematurely cicatrized, generally remain more or less painful; moreover, they are apt to ulcerate on the slightest causes, and even sometimes to mortify. * * * * In fine, Nature must work slowly and without disturbance to effect the process of healing the wounds after surgical operations, whether these have been performed for chronic diseases or for recent injuries. This department of surgical practice in England has always appeared to me to be far from the perfection which might be expected from such able men as are the surgeons of that country.

So much for the alleged superior advantages of secondary over primary union after amputations. *Mais il faut nous mettre en route.*

M. *Larrey* left London at the end of September, and proceeded to Chatham, were Sir James Macgregor received him with great kindness, and showed him every mark of courtesy. He was much pleased with the

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beautiful order and cleanliness of the hospital at Fort Pitt. He approved of the practice of having the bedding in all the beds folded back during the day, so that the soldiers could not be lying down upon them. The military discipline appeared to him to be very rigid and even severe; but the men, he allows, were well fed and clothed; and each one had a bed to himself. (We infer that such is not the case in the French hospitals.) *Larrey* then accompanied his host to the mess-room, where a handsome collation awaited him, and the health of "the surgeon of Napoleon," was drunk with great enthusiasm. "On leaving the garrison, military honours were paid to me, as to a general officer—a mark of distinction which alike surprised and delighted me. Altogether, the visit to this place was so gratifying to my feelings, that it can never be effaced from my memory."

When he arrived in Calais, he found awaiting him a summons to Picardy to visit General *Caulincourt*, Duke of Vicenza, who was lying dangerously ill. Thence he went on to Paris, to resume his official duties at the military hospital of the Royal Guard, and to complete several projects which he had in hand. Among other things, he submitted a report on the state of the barracks and hospitals in England, to the Minister of War, General *De Caux*. He engaged also in the publication of his *Clinique Chirurgicale excercée particulierement dans les Camps et les Hôpitaux Militaires, depuis* 1792, *jusqu'en* 1829—in which year he was elected a member of the Institute, on the death of his preceptor, Professor *Pelletan*. He had long been ambitious, he tells us, of this "glorieuse admission;" and at length his desire was attained.

In the course of the following year, 1830, so memorable for important events, happening to be upon a jury, when a handsome and well-educated young man was tried and convicted of forgery, and thereupon condemned to be *branded* and sent to the hulks for ten years, the Baron was so afflicted at this barbarous sentence—of the shoulder being branded with a hot iron by the common executioner,—that he made an appeal to the royal clemency to have it remitted in the present instance. The favour was granted; and before many months were over, I had the satisfaction, adds he, of finding, that this article of our criminal code was expunged on the establishment of the present dynasty in France. During the Revolution of this year, I had a serious, and sometimes even a dangerous, part to perform in the execution of my official duties. The Royal Guard, as the main prop of the Royal cause, were especially obnoxious to the people; and, on the third day of the fighting, a vast mob had collected and determined to break into my hospital and wreak their vengeance against the wounded inmates. I threw myself amongst the assailants, and addressed to them a few forcible words, appealing to their honour and sense of pity in behalf of my poor patients. The result was that they dispersed, having first made themselves masters of all the soldiers' fire-arms. Having been subsequently appointed a member of the medical commission to report upon the wounded of the three days, I received, as a reward of my services, the Decoration of July from the hands of his Majesty King *Louis Philippe*.

In the latter part of this year I was invited by King *Leopold* to Belgium, to organize the *ambulances* of his army, and to inspect the hospitals in different parts of his new country. My attention was also very particu-

larly directed to the study of the Epidemic Ophthalmia, which had already struck with blindness a great number of the Belgian troops.

The hospital at Antwerp I found to be very faulty in its construction and general management. The ophthalmic cases, amounting to fifty at least, were all assembled together in an ill-ventilated dark ward on the ground floor, and the unwholesomeness of the place being not a little increased by their being close stools for the use of the patients! Upwards of thirty of these poor fellows were entirely blind.

The worthy Baron here enters upon a brief digression to show that the French soldiers are on the whole infinitely superior, not only in physical force but also in intelligence and moral energy, to the Dutch, Belgian and German troops. We did not for some time perceive the object of introducing this patriotic comparison here, till we came to a passage where he alludes to the stolid indifference of the Belgian blind soldiers under their bereavement, and contrasts it with the fierce despair of the French, many of whom in Egypt, he tells us, threw themselves into the Nile, or put an end to their lives with their fire-arms!

He strongly condemns the practice that was pursued by the Belgian surgeons in the treatment of this Ophthalmia. After the application of a few leeches to the temples, a collyrium, containing some corrosive sublimate and extract of belladonna, was generally used. "The effect of this application was to blunt the nervous sensibility of the eye, to paralyze the retractile or elastic action of its vessels and membranes, and consequently to keep up the *stasis* of the fluids in the deep-seated tissues. Besides these injurious results, the tissue of the cornea often became thereby shrivelled and crisped, so that ere long it was rendered more or less completely opaque and insensible." He advised that all the patients should be immediately sent to more healthy quarters, and that the wards should be well lime-washed; he also pointed out the mode of treatment (it is not specified) which he had found most useful in his own experience in Egypt and elsewhere. The condition of the military hospitals at Louvain and Liege was no better than he had found at Antwerp: the wards were unwholesome, and the soldiers, besides everlastingly smoking, were often in a state of "malpropreté repousante." The medical treatment of the ophthalmic cases was the same here as what we have already alluded to. In the report, which subsequently he sent in to King Leopold, we find the following passage, that deserves especial notice.

> "My inquiries respecting the health of the troops of your army have convinced me that the ophthalmia, which is so wide-spread and so destructive, is by no means contagious in its nature, as many of the medical men suppose; and that it has been produced exclusively by certain causes of insalubrity to which the soldiers are exposed; as, for example, by their not guarding themselves against the humidity of the nights, by their excessive smoking even within the barracks and hospitals, by the immoderate use of spirituous drinks, and by the neglect of cleanliness."

On his return to Paris, *Larrey* was appointed head surgeon of the Hôtel des Invalides, of which Marshal *Jourdan* was then the governor. France was at that time threatened with an invasion of the Oriental Cholera; the disease having already made its appearance in Germany and Britain. The pestilence was not long in reaching Paris, and the Hôtel

was one of the places that was first attacked. A good many deaths took place within a short time among the inmates; but the Baron was satisfied, after a minute examination of the subject, that the malady did not propagate itself by contagion.

He seems to have been very anxious at this time to have introduced a good many changes into the general economy, as well as the medical management, of the old soldiers; such as establishing a set of lectures, musical concerts, and other modes of recreation among them; but his zeal appears to have somewhat outrun his discretion, as none of these changes were allowed by the administrative council. We should think that the worthy Baron must on a good many occasions have given offence to his medical brethren also, by his almost invariable censure of their practice, and his frequent and excessive laudation of his own. We must however make some allowance for the garrulous egotism of old age and long service.

In September, 1834, he started with his son on a tour to Italy, inspecting on his way the military establishments in the South of France. At Genoa he first visited any of the foreign hospitals. The surgical practice pursued there did not meet with his approbation: "elle est eloignée des bons principes et depourvue de toute methode."

A visit to the beautiful cemetery of Leghorn, the *Campo-Santo*, where so many strangers from the North—the victims of phthisical disease—are interred, suggests the following very sensible remarks:

"It is a very fatal error, or perhaps rather a very pernicious prejudice, for medical men to imagine that mild and warm climates can effect a cure of thoracic diseases. The cold and humidity, which generally are the determining causes of these affections, doubtless aggravate their symptoms; but, when the mischief has reached the second stage of its career, atmospheric heat almost always does harm instead of good, and very generally accelerates the fatal issue. It is the same with phthisis as with all chronic maladies that are attended with hypertrophy or engorgement of the parenchymatous or membranous viscera."

Our author goes on to point out his method of treatment in these and other organic diseases—induced, according to him, by the presence in the system of a peculiar virus or morbific principle. (!) His chief remedies seem to be mercury and the use of the *moxa*—by means of which he has effected, he assures us, many most marvellous cures: *experientia probat.*

The number of monuments in the cemetery of Pisa over the foreign victims of chest-diseases is even greater than at Leghorn; and yet a residence in the former city is especially recommended by many physicians in such cases!

At Rome he visited Cardinal *Fesch*, who introduced our traveller to his sister, Madame *Letitia*, the mother of *Napoleon*. She was at that time eighty-eight years of age and entirely blind. Her reception of the faithful companion of her illustrious son was most affectionate. His report on the state of surgical and medical practice in the hospitals of the Eternal City is far from being favourable. According to him, the use of cupping is scarcely known; at least, this most valuable remedy seems to be never employed, in Italy. "I had," says the Baron, "great pleasure in showing some of my professional brethren in Rome the manner of practising this

method of revulsive bleeding, and also the application of the moxa, according to my plan."

Syphilis is exceedingly common in Rome: but the disease is usually not very severe. It is almost always treated with mercury, administered internally, and rubbed on the soles of the feet. It is truly a melancholy sight to find in the wards of the hospitals, girls of ten, and even of eight, years of age, labouring under this disgusting malady.

The Baron was much struck with the prodigious number of ecclesiastics in modern Rome. Their number is said to amount to not fewer than 25,000—more than a sixth part of the whole population. They are usually of a plump and healthy-looking exterior. In all the convents, there is a *pepiniere* of children; and these are usually attired in the dress of monks. The vast number of beggars too excited feelings of disgust and regret, wherever he turned his eyes. The lower classes of the Roman population reminded him a good deal of those whom he had seen in Dublin; the same contrast between the opulence of the few, and the miserable destitution of the many, is too often painfully striking in both cities. "Every thing languishes in Rome. The Papal government does nothing to rectify abuses, to correct prejudices, to arrest the destruction of the very monuments which form the country's glory, or to render the place more wholesome. Industry is utterly unknown; cities decay; and the people are becoming more and more degraded. Had *Napoleon* lived, this, the second city of the French empire, would have been alike reformed and embellished."

Our traveller returned from Rome to France through Florence, where he was hospitably received by Prince *Louis Buonaparte*, the ex-king of Holland, his sister *Caroline*, the widow of *Murat* and ex-queen of Naples, and his sister-in-law, the ex-queen of Spain.

He inspected with great care the hospital establishments at Toulon, where the chief surgeon, M. *Reynaud*, showed him every mark of attention. He saw, in one of the wards of the marine hospital there, a fractured leg placed in *Mayor's* suspended board: he strongly disapproved of this apparatus, and recommended his own "appareil inamovible." At Aix, the hospital, he tells us, is large and beautiful; but the surgery, that is followed, is that of the 17th century. Among other cases, he severely criticizes one of amputation of the right leg *immediately above the ankle-joint*. The stump was left pointed and conical, and the limb was always in a half-bent position, so that the patient could scarcely make use of any sort of wooden leg. This operation should never be performed: the preponderance of power in the flexor muscles over that of the extensors must always prove an impediment to a patient being able to walk with the stump introduced into the case or *etui* of any mechanical leg.

At the Hôtel des Invalides at Avignon,—of which General *Lenoir*, who lost a leg in Russia, is the governor—the Baron saw a number of his old comrades of the Imperial Guard, who, he was delighted to find, were well cared-for in every respect.

He had not been long in Paris, when he was called upon by Marshal *Maison*, the then minister of war, to repair to the South of France, where the cholera had made its appearance, and was occasioning the greatest panic. He accordingly started on the 21st July, 1835, for Marseilles, and

arrived there in three days afterwards. The inhabitants, in this and the other towns in which the epidemic had broken out, were in a state of the utmost alarm. Crowds of people had left their houses and were taking refuge in the fields. Even the medical men had partaken of the general trepidation; for no one, we are told, had been bold enough to examine the body of a patient who had died of the disease, till the Baron set them the example. The priests too had, in his opinion, contributed not a little to increase the general alarm, by getting up religious processions, in which the holy relics of the different churches in the place were paraded about the streets, with the view of deprecating the Almighty's anger. *Larrey* takes this opportunity of expressing his regret, that *Napoleon's* intention to confine all religious ceremonies to within the walls of churches, was not in force at the present day, throughout the country. In the fear and confusion that every where prevailed, the bodies of the deceased were often buried within three or four hours after death. On one occasion it was alleged that a women had been interred before she was quite dead. This circumstance produced the greatest excitement; and had it not been for the Baron's suggestion, that every dead body should be covered over with a sheet that had been immersed in a solution of chloride of lime, and that no funeral need take place within twenty-four hours after death, there would, he says, have been a popular tumult. By his promptitude and zeal, he succeeded in effectually quieting the apprehensions of all classes.

Larrey seems to have regarded the morbific principle of Cholera as of an animalcular nature; and he talks of the disease as a "neurose ataxique," evidently regarding it as allied to certain malignant fevers. He peremptorily denies its contagious character; but he admits that its diffusion may be much promoted by want of cleanliness, tainted air, &c. His treatment consisted in the use of ipecacuan emetics in the first instance; in frictions of the surface with snow, or, in defect of this, with camphorated oleaginous on spirituous embrocations; in the administration of ice, and of light aromatic infusions; and subsequently in the application of the cupping-glasses—with or without the scarificators—to the hypochondria, epigastrium, abdomen and back, and afterwards of sinapisms and moxas to different parts of the body. He disapproves of almost all the internal remedies that have been recommended, and reprobates with especial severity the practice of injecting fluids into the veins. But it is unnecessary to pursue this subject. On his return to Paris, he made an elaborate report upon the epidemic, and received the thanks and approbation of the Commander in Chief. In 1841, *Larrey* went over to Algeria to visit the military hospitals in that new colony. Immediately upon his return from this expedition, he was taken ill and died at Lyons. In a former Number (for January, 1843) of this Journal, we have given an account of the funeral orations that were pronounced over the illustrious deceased: to that article we may refer for some further particulars of his life and services.

In an appendix to the present volume, we are presented with a "Statistique Chirurgicale," or series of short notices of the most distinguished of our author's patients, prefaced by these words:—"The history of their wounds may, I think, occupy a few pages that will prove not without interest or value for the study of those memorable wars which

France had to sustain against all the powers of Europe, from 1792 to 1815." We shall select the most interesting of these notices.

General *Almeras* was severely wounded at the battle of the Pyramids. A musket ball traversed the pelvis from before backwards, passing between the testicles, perforating the neck of the urinary bladder and also the rectum, and escaping from the inner part of the right hip. In spite of the dangerous nature of the wound, this brave officer recovered, and eventually served in the campaigns of Germany, Russia and France. This case is certainly one of the most remarkable that I ever met with in practice.

General *Andréossy* suffered severely from the endemic ophthalmia in Egypt; but recovered perfectly. He died in his native town of Castelnaudari.

General *Arrighi*, Duke of Padua, was wounded in the neck by a musket-ball at St. Jean d'Acre. The right carotid artery was wounded; and he must inevitably have died of hæmorrhage if a soldier had not had the presence of mind to introduce his two fore-fingers into the wounds, until I arrived and tied the vessel. During the operation, a shell exploded over our heads; but, by a sort of miracle, none of the fragments struck us. The recovery was complete, and the General is still alive.

Prince *Eugene Beauharnais* was wounded by a ball in the right temple, at the seventh assault of the same fortress, St. Jean d'Acre. General *Bertrand* too was similarly wounded at the first battle of Aboukir. It was on this occasion that *Napoleon* first became acquainted with this most faithful and devoted of his servants.

Marshal *Bessieres*, Duke of Istria, received a severe contusion of the thigh in the celebrated battle of Wagram; his horse was shot under him at the time. This great warrior was subsequently killed by a cannon-ball, while reconnoitring the enemy's lines on the evening before the battle of Lutzen.

General *Blaniac* received, at Aboukir, a gun-shot wound in the right side of the chest. The ball had passed from before backwards, following the direction of the third sternal rib to the seventh, which was fractured in its posterior third; the middle lobe of the lung was injured, and the intercostal artery lacerated. There was a good deal of hæmorrhage from the anterior wound. Symptoms of sanguineous effusion into the chest subsequently occurred, and the operation of *paracentesis thoracis* was performed by enlarging the wound behind. Upwards of a *litre* of dark coloured fluid was discharged. By the most assiduous care, continued for three or four months, this meritorious officer quite recovered his health.

The only real wound that General *Buonaparte* (so he is styled here by our author) ever received in his long career of danger, proceeded from a kick of the first Arab horse which he mounted, on leaving the Desert of Lybia. The contusion was followed by an extravasation of blood, to which I gave vent by a small incision. The wound quickly healed. (We have surely read somewhere that *Napoleon* received, in one of his Austrian campaigns, a contused wound of the leg, that proved, however, to be of no great severity, although great alarm was at first occasioned in the army by the rumour of it.)

General *Caffarelli* had his right elbow shattered at the siege of St. Jean d'Acre; he was overturned by the blow and fell heavily on his right

side. The arm was immediately amputated, and everything went on favourably till the 21st day, when symptoms of hepatitis made their appearance. A few days afterwards he died. On dissection, several large abscesses were found in the liver; one of these had burst into the abdominal cavity. The suppurative inflammation had doubtless been induced by the fall.

General *Champeau* was severely wounded by a cannon-ball at Waterloo. Before I could reach him, a sudden charge of the English cavalry obliged me to withdraw to a considerable distance; and the poor wounded man, like many others, died on that disastrous field without relief.

General *Cheminau* had his right leg disorganized by a cannon-shot, at the battle of Lutzen. Although the injury of the soft parts and bones extended close up to the knee, yet, as the joint itself appeared to be intact, I determined to amputate the limb immediately below it. Having made a flap, I disarticulated the head of the fibula, and sawed the tibia across, directly below the attachment of the capsular ligament. I was then surprised to find that the two condyles of the bone were separated by a vertical fracture; the ligament, however, remained uninjured, and there was no symptom of extravasation within the joint. A uniform and circular compression was maintained around the condyles of the tibia, and the dressing of the stump was finished by the application of my unremovable bandaging. This was not removed for nine days, and then immediately re-applied. The success was complete.

General *Coutel*, commanding the company of the aeronauts attached to the army of Egypt, and who, by means of ascending in a balloon, had ascertained the position of the enemy's army before the celebrated battle of Fleurus, received a musket-ball in his right arm at St. Jean D'Acre. Although the humerus was broken, and the injury of the soft parts severe, I determined to try to save the limb. The ends of the bone did not, however, unite, and a false articulation was formed.

General Count *Daboville*, now a peer of France, was wounded most severely in the right shoulder at the terrible battle of Wagram. This was one of the fourteen amputations at the shoulder which I performed on that day! Of these cases, twelve recovered perfectly; one patient was killed accidentally by being thrown out of the *ambulance;* and another died of hæmorrhage during the subsequent evacuation of Vienna.

General *Damas* was killed by a cannon-shot which struck his chest, at the battle of Moskowa. He was one of the 40 general officers who either fell or were most severely wounded on that dreadful day.

General Count *Danthourd* was wounded at the battle of Pesth (1805) by a musket-ball, which, after breaking his spur, doubtless penetrated into his right tarsus, and there lodged deeply. Imagining that his wound was only a flesh one, he applied a piece of wetted rag to his foot, and straightway continued his march to the field of Austerlitz, at the glorious battle of which he was present. His wound healed; and he experienced no inconvenience in the foot until 15 years afterwards, when he began to feel sharp pains in a tumour as big as an olive, which was situated on the dorsal region of the tarsus. Two of the leading surgeons in Paris considered it to be an exostosis; and the General himself was not aware that any ball

had ever lodged in the part. On his showing it to me I soon recognised what it was, and told him how he might get rid of it. The ball on extraction proved to be angular, and was lodged in a fibrous cyst.

General *Desaix* was wounded, in one of the combats before the capture of the lines at Weissembourg, by a ball which perforated his left cheek. He was killed at the battle of Marengo, " dont il fixa la victoire."

The Duke *Deselignac* received a gun-shot wound in the left foot and ankle-joint in the last combat of July, 1830. The limb should unquestionably have been amputated at the time; but this was not done, and, on the seventeenth day after the accident, symptoms of tetanus supervened. On being called into consultation, I recommended that the limb should be amputated; but this proposal was not acceded to by the other surgeons in attendance, who, in consequence of the inflamed state of the leg, dreaded gangrene of the stump coming on. The operation was however performed early next morning. The edges of the wound were simply approximated, and kept so by means of lint smeared with a layer of styrax ointment: this position was facilitated by my having made, during the operation, two perpendicular incisions, one over the crest of the tibia and the other on the opposite side. *The first dressing was not removed for nine days*, and then the wound was found to be suppurating freely; it was entirely healed by the 31st day after the operation.

General *Dulong* received a gun-shot wound in the right axilla in the Polish campaign of 18ι.7. The ball had passed through the tendon of the pectoral muscle, and the plexus of nerves, grazing the shoulder-joint. Although there was scarcely any hæmorrhage, there was good reason to believe that the axillary artery had been divided. Some years subsequently this officer called upon me for my advice. I then learned that, immediately upon the receipt of the wound, the extremity had been stricken with a paralytic torpor and a sense of most distressing coldness, and that no pulse could be felt at the wrist. It had been unwisely determined to try to save the limb. The consequence was, that the hand and arm remained quite paralyzed, and became so atrophied as to resemble a part of a mummy rather than of a living man. I recommended him to submit to amputation; but he would not. His infirmities increasing, he committed suicide.

Marshal *Duroc*, Duke of Friuli, was wounded in the right groin, by a piece of a shell at St. Jean d'Acre. At the close of the battle of Wurtschen, 1813, a cannon-ball which had cut the body of General *Kirschner* (who was riding at his side) in twain, grazed him in the belly. A large portion of the abdominal parietes was carried away, and the bowels wounded in several places. He survived about thirty hours in dreadful ag ny.

General *Foy* was under my care in his last illness, the disease being cancer of the stomach. " Had his medical attendants made use of the moxa as I recommended, his life might probably have been saved, as I have succeeded in doing so in not a few cases in private practice."

General Baron *Ganan* was wounded at the battle of Dresden in the occiput. It was necessary to apply the trephine to remove some portions of the depressed bone: ultimately he recovered. "A phenomenon, little known to medical men, was often noticed by us in this case. When the

ear was applied to the cicatrix over the perforation, the *bruissement* of the cerebral arteries was distinctly perceptible; and the General himself could hear the sounds of the voice when directed to the seat of the wound—a circumstance that still continues, and therefore clearly shows that the opening in the cranium is not yet entirely closed." (Is there anything wonderful in this?)

Marshal *Grouchy* received several severe contused wounds in the thighs and legs at the battles of Moskowa and Craonne. In the case of his wife, *Madame la Marechale*, I excised the left mamma for a cancerous tumour. This lady quite recovered; she subsequently died very suddenly from a sort of spasmodic cholera, or acute neurosis.

General *Kleber* received, at the capture of Alexandria, a ball that struck him in the right temple, divided the integuments, and grazed the parietal bone. I dressed the wound at the base of Pompey's Pillar, and he was sent on to Alexandria. He was subsequently killed at the battle of *Heliopolis*, where I was exposed to the greatest danger in the discharge of my professional duties.

Marshal *Lannes*, Duke of Montebello, was struck by a musket-ball in the right leg, at the battle of Aboukir. Symptoms of tetanus threatened to come on, but were fortunately subdued. He returned with his colleague *Murat* to France, a few weeks after General *Buonaparte*. He had been wounded also in the temple at the thirteenth assault of St. Jean d'Acre. Some years afterwards he received several wounds in various engagements in Spain. At the famous battle of Essling (1809) his right leg was shattered by a cannon ball, which passed through the knee-joint and wounded the flesh of the left thigh. Immediate amputation was performed by me; and he was senton to Ebersdorf, where he caught the typhus fever, which prevailed at that time in the army: he died on the 13th day after the battle.

General *Lawless*—once a Professor of Physiology in Dublin!—who commanded the third foreign regiment, consisting almost entirely of Irishmen, had his left leg shot away by a cannon-ball at Lovemberg, on the frontiers of Bohemia. I amputated the limb immediately below the head of the tibia; and, as the army were retreating back upon Dresden at this time, I advised my patient to ride direct to his own home in France, without doing anything to the dressings of his wound, except sponging their surface daily, and keeping the stump enveloped in a piece of linen-cloth, or a sheep's skin. By following my directions, he rode on horseback the entire distance from the scene of action to his residence in Tours, having his stump all the while suspended by a belt that passed over his shoulders, and without having it dressed once. On removing the apparatus, when he reached his journey's end, the wound was nearly healed. As a mark of his gratitude, the General made me a present of a magnificent English engraving of *Hunter*.

Baron *Menou*, the third in command of the Egyptian army, was seized with sporadic plague, just before our debarkation to France: already there were three carbuncles on the right leg, and an incipient one had appeared in the right groin. Unwilling to make the Captain of the English frigate (Dido)—which was to convey us home—acquainted with the real facts, I had the General strictly confined to his own cabin, and I then excised the

carbuncles,* administering internally camphor, nitre, bark, and laudanum. The wounds suppurated freely, before they healed. He was completely cured, when we reached Toulon.

General Viscount *Mermet*, in consequence of a fall upon his loins in one of the last actions in Italy under Prince *Eugene*, became entirely paraplegic; the palsy being accompanied with incontinence of the urine. Cupping in the first instance, and subsequently the repeated (20 times) application of moxas, restored him to perfect health, so that he was able to resume active service.

General *Mireur*, after having been wounded in the right shoulder at the glorious battle of the Pyramids, was murdered a few days afterwards by the Arabs, while conveying the orders from *Buonaparte* to Admiral *Brueys*, to weigh anchor and proceed direct to Corfu, for the purpose of taking in fresh troops and bringing them to Egypt. The death of this young officer was the cause of the destruction of our fleet at Aboukir, and of our subsequent loss not only of Malta, but also of Egypt, which would otherwise have become one of the richest and most beautiful of French colonies.

Marshal *Moncey*, Duke of Cornegliano, became affected, in 1830, with an enormous hydrocele. I performed an operation and effected a radical cure.

General *Netherwoot*, in one of the combats in Syria, received, from the hands of one of the Mamelukes, a sabre-cut in the right thigh: the entire thickness of the extensor muscles was divided down to the bone, and even this was deeply notched. The wound was very large as well as deep. While one of my assistants kept the limb completely extended, I passed ten stitches from the bottom of the wound through the flesh and integuments, so that the edges might be retained in exact apposition throughout the entire depth. After being bandaged, the limb was placed in a fracture-box, and maintained in a state of extension. This excellent officer was subsequently killed in the expedition to St. Domingo.

General Count *Pajol* was wounded in the left fore-arm at the battle of Moskowa. As both bones were broken, and the soft parts much injured, many surgeons would unquestionably have recommended immediate amputation; but I determined to try to save the limb. After having freely *debridé* the wound, and removed all the fragments of bones, I brought the edges together, and applied my apparatus, which I rendered immovable, the fore-arm being kept bent and suspended in a sling. This distinguished warrior accompanied the march of the troops during the dreadful retreat from Russia; and, although the wound was not dressed above five or six times, it eventually cicatrized completely, without the movements of the limb being at all impeded.

General *Silly* was wounded by a cannon-ball in the right knee, at the second battle of Aboukir. I had scarcely completed the amputation of the limb, when a charge of the English cavalry came down upon us. I took the wounded man upon my shoulders, and carried him along a very uneven

* This appears to us very extraordinary practice; and yet the Baron continued in after-life to be so convinced of its propriety that—as we have seen in a preceding page—he actually recommended its adoption to the physicians in Dublin.

road, to the rear-guard of our army. I arrived at Alexandria with my honourable burden, and had the satisfaction there of completing the cure.

Marshal *Soult* was never dressed by me on the field of battle; but I attended him in Paris for a severe contusion of the leg, which had been fractured. A traumatic sanguineous tumour supervened: this required a delicate operation should be performed. The success was complete; and my illustrious patient speedily recovered.

Marshal *Suchet*, Duke of Albufera, on returning from his most arduous campaigns in Spain, consulted me for a cancerous affection of the stomach, the precursory symptoms of which had already appeared. The disease, although it had been very sensibly arrested, finally proved fatal.

Marshal *Victor*, Duke of Belluno, was wounded in the right thigh, at the battle of Craoune (1814). The ball had passed between the femur and the femoral artery, which I found to be partly denuded: the sciatic nerve was injured. The two wounds were immediately "debridées," and subsequently dressed after my usual plan. The Marshal continued to suffer from a traumatic neuralgia to the end of his life, in spite of every remedy that was tried.

General *Zayonchek*, 75 years old, was wounded in the knee at the passage of the Beresina. The wound required the amputation of the limb. I performed the operation under the cannon of the enemy, and while there was a very heavy fall of snow. To prevent my being incommoded by "ce meteore," two general officers held the patient's cloak over our heads. He returned to Warsaw, his native place, and finally recovered. He was subsequently made a prince, and the Viceroy of Poland, by Emperor Alexander: he died at the advanced age of 86 years.

As frequent allusion has been made, in the preceding pages, to the "appareil inamovible" used by our author in his military service, it may not be unprofitable briefly to describe it here, although we have given an account of it some years ago in this Journal. One or two prefatory remarks may be made with advantage.

Larrey is a great enemy to the frequent dressing of all recent wounds, whether these be simple or complicated with fracture of bones. In the case of gun-shot wounds, the frequent renewal of the dressings is, we need scarcely say, often quite impracticable; it is therefore a matter of serious importance to know the best mode of proceeding under such circumstances. The authority of so experienced a writer as our author will very properly command no ordinary attention. The main object of his instructions seems to be, to place the wound in such a position that Nature is interfered with as little as possible in the reparation of the injury that has been inflicted. With this view, he seeks to maintain the part in perfect quietude, guarding it from exposure to the outward air, and maintaining a proper temperature around it; and effecting these ends, without confining the patient to bed, or even to the house. He found by experience that in cold seasons wounds were, on the whole, more tardy of healing—especially if they were frequently exposed to the air—than in warm ones. He had too often occasion to verify the truth of this remark in the dreadful campaigns of Russia, Saxony, and France; especially when contrasted with the memorable one of Egypt. It was during these wars that the admirable effects of his "appareil inamovible" were most conspicuous. We were

retreating, he says, all the while, and yet unwilling to leave our wounded behind. Accordingly, most of our patients, after they had their wounds dressed according to my plan, were immediately despatched forwards, and some of them even reached their homes in France before the original dressings of their wounds were removed. We give but one instance. A soldier, after having his arm amputated at the shoulder-joint after the terrible battle of Moskowa, was advised to proceed direct on to his native place in Provence, and do nothing to the wound except keep it clean by sponging away any discharge from the outward dressings, and cover the limb with a good sheep's-skin, to guard it from the cold and damp air. When he reached home, and the dressings were removed, the wound was found to be nearly cicatrized. This is one of many scores of similar cases, where the primary dressings were not removed for two, three, or even four weeks after they had been put on.

The following are the instructions given by *Larrey* how to arrange and apply his "appareil." If the fracture of a limb be complicated with a wound, we should first simplify it, as much as possible, by freely incising (*debrider*) its edges, extracting all foreign substances or pieces of broken bone, and arresting the hæmorrhage. When all has been done, we should approximate the edges and keep them in apposition by means of a piece of linen (linge fenetré) on which some balsamic substance, such as the Styrax ointment, balsam of Mecca, &c., has been spread. Pledgets of lint, carded cotton or tow, are then to be placed over the dressing and the anfractuosities that correspond to the wound; also, some square compresses dipped in a glutinous strengthening fluid, that is prepared by beating up the white of two or three eggs with camphorated wine or vinegar, or, in lieu of these, with salt water. These compresses should be carefully applied over the whole of the injured part, while an assistant is engaged in maintaining the fractured bone or bones in exact apposition by appropriate extension and counter-extension. These compresses perform the service of immediate splints, without their inconvenience. They are kept in their place and are moreover strengthened by an eighteen-tailed bandage, which, when properly applied, maintains every thing firmly together. The foot and ankle-joint should previously be enveloped in long compresses, that have been wetted in the same fluid. A pad of tow, of a pyramidal shape, is to be placed under the *tendo Achillis*, to make all level and even, so that the pressure of the apparatus may be uniform throughout. The surgeon is then to take two cylindrical rolls of new rye straw, and wrapping them up in the opposite edges of a towel or small sheet, which is to be stretched out under the leg, he applies them on each side, having previously interposed two or three flat cushions filled with oat-chaff, to prevent the pressure of the straw rolls on the skin. These are secured in their place by a good many broad tapes or ribbons, which should be tied over the outer roll of straw, and in such a manner that they do not press directly upon the crest of the tibia. The advantage of the straw rolls is, that they are so elastic, that, although they give way at first to the swelling of the limb, they continue to remain in close contact with it as the swelling subsides, and no void ever exists between it and the apparatus—an objection to the paste-board splints, and other substitutes which have been suggested of late years. As a substitute for the

foot-board, I use a piece of a folded sheet placed like a stirrup under the sole, some tow being previously interposed to fill up the concavity; the two ends are brought up, crossed over the instep, and then secured to the straw-rolls with strong pins.

The loose end of the sheet, stretched under the leg, which extends below the inferior ends of the straw-rolls, is to be folded under the foot and over the ends of the rolls, and then firmly secured by a few stitches or pins.

With such a simple, and yet so efficient, an apparatus, the reader will readily understand how a patient is able to walk about with the aid of crutches, the foot being merely suspended by a ribbon passed over the neck. The same apparatus is equally well suited for fractures of the body, or of the neck of the femur. We have only to lengthen the external straw-roll as far up as the pelvis, and secure it firmly by a belt passed round the body. The limb, in such cases, should be kept in the horizontal position, until the callus has become consolidated.

* * * * * *

The camphorated albumino-vinous wash, which we have recommended, has the great advantage of increasing the tonic action of the injured parts, and of preserving their natural heat, without obstructing the meshes of the linen or cotton cloth that is used in making the apparatus. The thinner portion of the discharge oozes out, and may be removed with a sponge, whenever it is necessary.

Select Clinical Reports; with Observations. By *George Barlow*, M.D. (Guy's Hospital Reports, October, 1844.)

This is one of the most important papers in the October number of "Guy's Hospital Reports," and reflects the highest credit on Dr. Barlow, as a man of philosophic mind, accurate observation, and excellent judgment. Such reports as these will stimulate the medical officers of our great establishments to select the more intelligent of their pupils to record with fidelity, the interesting cases that daily occur in the routine of their practice, and communicate them to the less fortunate of their brethren, for their guidance in the private walks of life, and thus diffuse the benefits of their experience among all ranks of society. Such communications, even in a mercenary point of view, are the best passports to fortune as well as fame; and the medical officers of our public institutions would find their fee-books greatly increased in size by their suffering their brethren to participate in the inestimable opportunities which they, themselves, enjoy.

The philanthropic spirit of the sainted Guy (for he richly deserves *Sainthood*) seems to have descended on the mighty building which he erected for suffering humanity, and to animate all its conductors with the zeal of Christian charity. They have set a noble example to other hospitals, metropolitan and provincial, in the publication of their Reports, which

will transmit their names to posterity as disinterested benefactors to the human race, by their efforts to contribute to the stock of practical knowledge.

What is SAINT THOMAS about, in the immediate vicinity of ST. GUY? Is he reading Homilies instead of recording histories and cases? Is SAINT BARTHOLOMEW more engaged in the study of zoology outside of his walls than of pathology within his gates? Is SAINT GEORGE, in the aristocratic West-end, still tilting at the dragon—staring at the great green man in the Park—or lost in admiration of the splendid corteges that move down to Buckingham Palace? What are the grave and learned DOCTORES ET CHIRURGI, of that castellated mansion that faces the venerable Cathedral in Westminster, doing? Are the mephitic vapours that issue from the old cemetery, near Lincoln's-inn-fields, benumbing the activity of our worthy brethren in that quarter? Why do not the great Provincials open the records of their medical and chirurgical transactions, and allow the treasures of their experience to circulate on the four winds? Why have our able contemporaries of ERIN, slackened their pace, and ceased to carry out the good work which they so auspiciously and ably commenced a few years ago, in the shape of the "DUBLIN HOSPITAL REPORTS?" We trust that a new era is approaching, when the example of "GUY'S" will dispel the cimmerian cloud that has, too long, hovered over institutions designed for the benefit of all, and not for the gain of a few!

But we must return to Dr. Barlow. The machinery of the clinical establishment at Guy's deserves praise and imitation. We recommend it to those who are thinking of following the same path.

The first subject that occupies the attention of our talented author is CONSTIPATION of the bowels, illustrated by cases and remarks. It fills more than forty pages of the Reports.

CONSTIPATION.

It is natural and prudent when a case of serious constipation presents itself, to ask ourselves where is the seat of the obstruction—and what is its nature and cause? These questions are more easily asked than answered. Various symptoms, indeed, indicative of danger, are laid down by systematic authors—as sickness, pain, tenderness and tumefaction of abdomen—high-coloured urine, &c., but none of these are invariably present—some of them absent, even in fatal cases. The fact is, that accurate diagnosis is difficult—and even the most experienced of us are prone to error.

Case 1.—J. J., aged 26 years, was admitted on the 8th of March, 1844. Had had an attack of constipation twelve years previously, which yielded to aperients in a few days. Eleven years subsequently he had a similar attack, lasting six days, and removed by the long tube. Eight days before admission he had an evacuation, after which he was constipated, with a screwing pain in the epigastrium. On admission, the countenance was anxious—tongue moist—pulse small, 85—abdomen much distended by flatus—track of colon resonant on percussion—no sickness—urinates

freely. Five grains of calomel and one of opium statim—castor oil two hours afterwards—warm bath, which gave temporary relief to pain—assafœtida glysters returned, with very little fæculent matter. 9th. Much the same—bath repeated, and whilst there, the flexible tube, to the extent of 18 inches, was introduced, passing through fæcal matter, and giving vent to some flatus. No action of bowels. Four grains of colocynth with one of hyosciamus, every hour. 10th. No relief being obtained, six grains of calomel with one of opium. The long tube again, to 23 inches, and a quart of warm water injected. Some air and slightly tinged water returned—solution of five grains of tartarized antimony in three ounces of water thrown into the rectum. 11th. The pain recurring in paroxysms—warm-bath—warm water copiously injected—returned merely tinged. Twelve grains of calomel followed by castor oil, repeated in three hours. Same evening, the pain and distention increased—countenance more anxious—pulse full and quick—tongue furred. Tube again introduced 23 inches—large discharge of flatus, and, after injection of warm water, a discharge of green fæcal matter, followed by softness of abdomen and disposition to sleep. 12th. Re-accumulation of air—no more fæces. Nine grains of Barbadoes aloes every three hours—abdomen rubbed with croton oil—tube introduced in the evening, followed by a discharge of fluid fæces and air—turpentine enema. 13th, evening. Dusky countenance—jactitation—much pain in the loins—great distention—nausea—hiccup. One pound of crude mercury exhibited, with cessation of hiccup and nausea, and less distention—no evacuation. 14th. Dr. Addison in consultation. Venesection to syncope, with a minim and a half of croton oil. Blood firmly coagulated, but not buffed—much improved after bleeding—stomach irritated by the croton oil—passed some fragments of fæcal matter with much straining—green fæcal fluid drawn off by the tube—a grain of calomel with one of opium every four hours. 15th. The bowels washed out by the tube—discharge of green fluid fæces. Colocynth and hyosciamus pills every hour for six hours—turpentine enema in the evening—calomel and opium at bed-time.

16th. Much the same, and in consultation with Mr. Cooper, as to an operation, it was determined to wait another day, before opening the colon from the loins. Calomel and opium every three hours—larger discharge than hitherto of fæcal matter by the tube.

17th. Passed this morning, two pints of dirty green fæcal matter, well tinged with bile. He seemed better for a time, but gradually sunk on the 19th, with symptoms of ruptured bowel.

Sectio Cadaveris, 20th March, 16 hours after death.—"On reflecting the integuments of the abdomen, its cavity was found to be almost filled by an enormously distended, thickened, and hypertrophic sigmoid flexure, which had been twice turned on its axis. The descending colon, where it became continuous with this distended sigmoid flexure, passed in front of the rectum. Just above this portion of the colon there was ulceration of the mucous membrane, and in one place perforation of the intestine. The sigmoid colon had a twisted root, with a contracted mesentery; it crossed to the right, and suddenly back again; the upper part seemed the largest, but the whole resembled the stomach of a great turtle with a thickened and inflamed mesentery. The rectum was wide and pale; but immediately above the part where the intestine passed behind the descending colon, dilatation with thickening rapidly commenced. There was great

muscular hypertrophy of the sigmoid flexure, and a firm, thick lining, in part diphtheritic. There were no ulcers in this part. The transverse and descending colon were much dilated, tumid, and inflamed, diphtheritic and sloughing, with numerous ulcers: one of them had perforated the intestine just above the commencement of the sigmoid flexure. The small intestines were full and inflamed, and feebly glued together in parts with whitish soft fibrin: there was, besides, extensive recent peritonitis.

"The liver, spleen, and kidneys were healthy.

"The left colon was, after death, easily opened through the abdominal walls from behind." 375.

In the course of a long and practical life, we have met with many cases of the above kind—some fatal, some fortunate. For many years past, we have made up our minds to this point, that, whenever constipation exceeds two or three days, inflammation and its various consequences—adhesions, ulceration, perforation, &c., are to be dreaded, and the grand objects of prevention. How fatally inflammation worked its way, and induced its devastations in the above case, a glance at the *post-mortem* must convince the least experienced reader! We confess, therefore, that we should have adopted the suggestion of Dr. Addison at a much earlier period than when that talented physician was called into consultation. We have no doubt that, in the case above described, certain mechanical elements of obstruction existed long before he came into hospital; but we submit that these very circumstances rendered it doubly necessary that depletory measures should be early adopted. Even at the late period when they were employed, a great, though not permanent, melioration of the symptoms followed the venesection.

We have several times exhibited quicksilver in such cases, but never once with success; and as to the operation of penetrating the colon, from behind, it is perfectly evident that it would have been of no use in the above melancholy case. Dr. Barlow makes many judicious remarks on the subject of constipation generally, and on that just related in particular. His candour in the narration of cases is above all praise, and the value of such candour can be appreciated only by those who have lived long enough in the world to know the care which is taken to keep in oblivion all cases that do not puff off the skill and the good fortune of the narrator.

Case 2.—Joseph H——, aged 12 years, admitted 30th March, 1844, employed as a servant at a zinc and scuttle-maker's, Newington, for four months past. Had had an attack of colic and constipation fourteen months previously, which was soon relieved by purgatives. Some similar attacks occurred afterwards. On the 24th March, was suddenly seized with severe pain in the abdomen, succeeded by violent retching, which continued all night, and next day Mr. Otway saw him, and prescribed various remedies, without effect. For six days before entering the hospital he passed neither fæces nor urine. The surface was now cold and pallid—face congested—expression anxious—eyes sunken—and the whole aspect indicative of serious mischief. There was tendency to stupor—voice feeble—tongue clean and dry—no blue line on the gums—no great distention,

days (it was
f April.

rather watery,

ormous deposit,
stomach was
of the upper
the three
a distinct, thick,
along the gut, but
under the cord;
bound to it, as also
remarkably free.
kidneys full and soft.

Barlow suggests—old
—impediment to peri-
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and death.
stages of inflammation.
When the patient was
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are tempted to quote.

n the quantity of the urinary secre-
lead to the belief that it was the ne-
nature of the obstruction; a belief
case 2, the suppression of urine came
ptoms. And, further, in cases of this
alimentary canal, and where, in conse-
led to expect, *a priori*, that the urine
are, then, rational grounds for believing,
urine is very deficient in quantity, the

obstruction is probably at the upper part of the canal; and that where it is abundant, at the lower."* 383.

A number of most judicious hints as to the treatment of ileus are given by Dr. B. in which he appreciates the value of blood letting. But, alas! the time for this measure is too generally gone by before patients enter hospitals. The necessity for attending to this important point, however, by private practitioners, is not the less obvious.

Case 3.—This is a more cheering one than either of the preceding. Augustus B——, aged 32 years, was admitted on the 3d of April, 1844, by trade a tailor, and subject to relaxed bowels, and they had not become confined till six days before admission—during which time he had thrown up every thing from his stomach.

Symptoms on admission.—Thirst, debility, anorexia—fever—depression of spirits—tongue highly coated—chest resonant—irritable action of heart—constipation of six days—urine loaded with the lithates—abdomen not distended, yet tympanitic—little pain. Pills of Barbadoes aloes every three hours—no effect from the pills—a turpentine enema, with *very* slight effect. Colocynth, calomel and hyosciamus, followed ultimately by a turpentine enema, brought away a copious motion; his bowels afterwards acting spontaneously, put an end to the complaint.

With the following interesting quotation we shall wind up Dr. Barlow's excellent report.

"In the preceding observations considerable stress has been laid upon the quantity of the urinary secretion, as a diagnostic sign of the situation of the obstruction in cases of constipation: for it seems that where there existed a perfect obstruction in the upper part of the small intestines, there was almost a total suppression of urine; where there was a diminution of the calibre of the canal in the same situation the urine was diminished in quantity; and where the small intestines were free, and the obstruction was seated in the colon, the urine was very abundant. If, then, we regard this statement of facts merely in a diagnostic point of view, as aiding us in determining the probable seat of obstruction in the alimentary canal, it will not be without its use; for every symptom must now be considered important which can help us to decide a question, the answer to which will go far towards determining the expediency of endeavouring to relieve an insurmountable obstruction by surgical operation.

"It is not, however, merely in regard to this diagnostic significance in this or that disease that we are to regard a circumstance that meets us under so many different, and even opposite conditions of the system; when the skin is dry and parched, and when there is excessive perspiration;—in profuse diarrhœa, and in insurmountable constipation;—in disease of the arteries, as well as of the veins;—of the lungs as well as of the heart;—of the liver as well as of the kidneys. The occurrence of this single point of resemblance in conditions of the system often diametrically opposite, is a fact too remarkable to be passed over, and is one, the further investigation of which may possibly throw some light upon the circumstances which determine the quantity of the urinary secretion, and afford some assistance in directing our efforts to regulate it."

"The sources whence the urine is derived are now, I believe, acknowledged

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* "Where the obstruction is low down in the small intestines there will be no suppression."

by most physiologists to be three. 1. The water taken into the alimentary canal with the ingesta. 2. Those soluble substances which are taken in the same way, and which do not undergo decomposition in passing through the extreme circulation, *e. g.* the neutral salts of metallic bases with mineral acids, which appear to act as stimulants to the kidneys. 3. Those lower organic products which are formed in the extreme circulation, or, in the phraseology of Liebig, the products of the transformation of tissues, *e. g. urea, urates, &c.* In order, then, to the due secretion of urine, the following conditions are essential:—An absorption of a sufficient quantity of water from the ingesta to hold the salts, the decomposed soluble matters, and the products of the transformation of tissues, in solution: the free transit of this water and soluble matters through the portal veins, the liver, the right side of the heart, the lungs, and the left heart, to the kidneys: a healthy condition of the extreme circulation, whereby the normal product of the transformation of tissues may be duly formed: a condition of the kidneys adequate to the carrying all these matters out of the system when applied to them by the blood. If, therefore, any one of these conditions be vitiated by disease, the secretion of urine will be impeded, either as regards its quantity or the proportion of the solid contents." 397.

Appended to Dr. Barlow's paper is a short case communicated by Dr. Lever.

Mrs. P——, aged 51, presented herself to Dr. L. with symptoms resembling the passage of gall-stones—excessive pain in the epigastrium, in paroxysms—jaundice—sickness—scanty urine—constipation, &c. &c. *Treatment.* Local depletion—calomel and opium—castor oil—enemata. The symptoms were removed, with the exception of the yellow tinge—and twelve months elapsed, with constipation and indigestion.

On the 5th of August, Dr. Lever was called to her, and found her labouring under excessive pain in the region of the gall-bladder—sickness incessant—extreme yellow tinge—bowels confined—urine high-coloured and scanty. Local depletion—calomel and opium—enemata, &c. But she suddenly sunk and died. The liver was found large and dark-coloured—no trace of gall-bladder—adhesions between the duodeno-pyloric orifice of stomach, and liver and pancreas. Pyloric orifice very much contracted from thickening of coats. About the middle of the duodenum a common quill could scarcely be passed through. Great contraction also obtained in the transverse descending colon and rectum, which would scarcely admit the point of a finger. About the centre of the ilium there was a biliary calculus the size of a walnut, partially sacculated.

CASE OF POISONING BY OPIUM. By *Alfred S. Taylor.* (Guy's Hospital Reports, October, 1844.)

THIS is one of the numerous instances of death being caused through the administration of opium to children by nurses. The form employed was unusual, namely, an infusion, made by pouring warm water into a bottle containing opium, and shaking the mixture well up. The child (æt. 14

months) had had slight diarrhœa, and, being restless, more than three teaspoonfuls of this fluid were administered to it in a brief space of time. It soon became drowsy, and continued comatose, with the exception of a short interval, until its death, which occurred eighteen hours after the administration of the drug. The chief post-mortem appearance consisted in a very congested condition of the blood-vessels of the brain, unaccompanied by any effusion. A portion of the mixture employed, being tested with nitric acid and sesquichloride of iron, gave unequivocal signs of the presence of opium. A small portion of the contents of the stomach were analyzed, but no opium detected therein; a fact nowise surprising, when the length of time between its being taken and the occurrence of death is considered.

Mr. Taylor observes, that toxicological writers have not alluded to the degree of *solubility* of opium in water, although this is a question likely to be put to a witness occasionally. By experiment he found that boiling water poured upon powdered opium, had, after twenty hours, taken up 4 per cent. of its weight, and from 2 to 4 per cent. when the common extract sliced was employed. The dregs still retained poisonous properties, capable of extraction by new infusion or decoction.

Tests.—Where opium cannot be detected by the smell, the author prefers the sesquichloride of iron as a trial test, discovering as it does meconic acid in $\frac{1}{160}$ of a gr. of opium.

"It might be supposed, that if, on adding strong nitric acid to a portion of the liquid, a bright red colour resulted, this would be a sufficient indication of the presence of morphia, and therefore of opium: but a serious mistake might be committed in such a case, unless the operator had previously employed the iron test, and determined the presence of meconic acid in the liquid. It is worthy of remark that the nitric acid test, while it destroys the colour given by the meconate of iron (a dark red), will bring out, when added to excess to the same portion of liquid, the peculiar bright amber-red tint which it is known to give in a solution of morphia. The tests for meconic acid and morphia may thus be applied to one quantity of liquid."

Mr. Taylor, after explaining the fallacies these tests, and that of iodic acid, may give rise to, next describes some experiments he instituted for the discovery of the smallest quantity of *morphia* which can be detected by each. He found that nitric acid detected $\frac{1}{15}$ gr. of muriate of morphia, diluted in 300 parts by weight of water; sesquichlor. iron detected the $\frac{1}{11}$ gr. in 231 parts of water; and iodic acid the $\frac{1}{100}$ gr. in 1300 parts of water. Thus *iodic acid* is by far the most delicate test, discovering as it does morphia in less than $\frac{1}{5}$ of a grain of opium; but it is also the one most open to fallacy, and cannot be employed in coloured organic liquids, containing these small quantities. Practically its utility is far less than would be anticipated from the result of experiments upon the pure salts of morphia. Other experiments were performed for the purpose of ascertaining how small a quantity of *meconic acid* need be present in a fluid, to admit of its separation by acetate of lead, and subsequent identification by sesquichl. of iron. No precipitate of meconate of lead occurred when the proportion of meconic acid was less than $\frac{1}{48}$ gr. *i. e.* about 0·34 gr. common opium. Unless, indeed, soluble matter of several grains of opium exists in the liquid for analysis,

[redacted]

it will be difficult to obtain meconic acid and morphia separately. The *iron test* for *meconic acid* is far more delicate than any of the tests for morphia, and is much less liable to be interfered with. The $\frac{1}{50}$ gr. or smallest visible portion of solid meconic acid is easily detected when free, while in solution, in a small quantity of liquid, even $\frac{1}{500}$ gr. may be discovered. Thus, the presence of this acid may be determined in a liquid from a much smaller quantity than would suffice to form a separable precipitate of meconate of lead; for, while for this latter $\frac{1}{3}$ of a grain of opium is required, less than $\frac{1}{100}$ grain suffices for the exhibition of the acid by the direct application of the iron test. The procural of the precipitate of meconate of lead does not increase the certainty of the iron test, but merely enables us to obtain the meconic acid in a concentrated and solid form.

ON THE ACTION OF DIGITALIS AND ITS USES IN DISEASES OF THE HEART. By *William Munk*, M.D. (Guy's Hospital Reports, October, 1844.)

THIS practical paper is founded upon upwards of 400 observations, which were made during five years of dispensary practice. The tincture has been found the most successful form of preparation as regards the effect produced upon the action of the heart, while the infusion is incomparably superior as a diuretic; and, from want of attention to this distinction, discrepant opinions as to the utility of the medicine have doubtless arisen. The powder, used alone, Dr. Munk considers as worthless, and although in combination (with mercury and squill) it forms a valuable diuretic, it cannot be even so employed as a sedative

The action of digitalis upon the heart is manifested in two ways: by the exertion of a depressing influence, and as an antispasmodic. Hypertrophy of the organ, whether simple or complicated with other disease, causing increased impulse, may be benefited by the *depressing* influence of digitalis, which is best obtained by giving the uncombined tincture, in tolerably full doses, at intervals of eight, ten, or twelve hours. The *antispasmodic* influence, acting so beneficially in the irritable condition of the heart manifested by palpitations, irregularity, &c., is that which is usually sought from digitalis. Dr. Munk does not agree with those writers who state the action of the digitalis upon the heart to be uncertain. Its operation is as certain, in properly-selected cases, as that of other medicines, and may be maintained with safety.

There are, however, circumstances under which this medicine cannot be exhibited usefully or safely. Thus, in a plethoric state of the system, its employment must be deferred until blood letting or other evacuants, for which it is no substitute, have played their parts. An inflammatory, or sub-inflammatory condition of the gastric and intestinal mucous membrane, seems to prevent the action of digitalis upon the heart; and increased irritation results if it be persisted in. Such complication of lesion

of the heart and gastric derangement is by no means rare, and in such cases prussic acid is the appropriate medicine. Quietude of mind and body much favour the action of digitalis. The recumbent posture is very adjuvatory to its depressent action; and Dr. Lombard truly observes, that it is rarely efficacious in those who take much exercise, or whose attention is much occupied during its use. Dr. Munk gives ♏ x. ad xxx. every eight, ten, or twelve hours, and is rarely disappointed. He does not reduce the pulse, which is to be carefully watched, below 60 in the adult, and thus derives the beneficial without risking the production of the dangerous effects.

Digitalis rarely acts as a *diuretic* when its influence upon the heart is marked, and *vice versâ*. The author quite concurs in the high opinion Withering entertained of its power of increasing the flow of urine, which is seldom accomplished by any other drug after its failure. It is not to the robust, florid, or wiry-pulsed, but to the enfeebled, shattered, condition of the system that digitalis is applicable. "If the pulse be feeble or intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, or the anasarcous limbs readily pitting on pressure, we may expect the diuretic effects to follow in a kindly manner. These remarks were penned, it is true, in reference to dropsy, from whatever cause arising; but, *mutatis mutandis*, they are equally applicable to all cases in which the diuretic operation of foxglove is required." In diseases of the heart, a diuresis is frequently a valuable means of preventing effusions by diminishing congestion, or of producing their absorption if they have already occurred; but whether digitalis be the appropriate remedy or not, depends in chief upon whether a sthenic or asthenic condition of the system prevail. Thus in the case of hypertrophy, it is seldom appropriate, while in dilatation it is usually the best of diuretics. Valvular disease is that in which digitalis proves most useful, except in cases in which this is complicated with hypertrophy. The *infusion* is to be given in doses of ℥ss. to ℥j. every six or eight hours. With a view of preventing the sedative operation of the drug, moderate exercise, short of diaphoresis, should when possible be taken. A moderate quantity of drink may be given, and the loins must be covered with a double roll of flannel, or, as recommended by Lombard, a stimulating plaster may be applied to them.

Dr. Munk believes that untoward and fatal effects, resulting from the continued employment of this medicine, are "exceedingly rare;" and cites the opinions of Drs. Holland and Pereira as confirmatory of his own.

"It has only occurred to me to see the slighter and less portentous of these symptoms as a consequence of foxglove; such as, inequality or intermittence of the pulse, loss of appetite, and frontal headache: either or all of which have at once subsided on discontinuing the medicine. I believe that such symptoms will only occur when the drug fails to act in a normal manner as a sedative or a diuretic. If either of these effects are once obtained in a kindly manner, I then consider my patient safe from the poisonous operation of the drug. If, on the contrary, it does not evidence its usual effects within a few days, the medicine, I believe, accumulates in the system, and the patient is in danger of experiencing its poisonous influence. I am therefore in the habit of prescribing it for a week: and, if within that period, I perceive neither sedative or diuretic effects, I then invariably desist from its administration. Let these effects, however, be once kindly induced, and the medicine may then be continued with safety for a con-

siderable period. In no one instance have I seen a bad effect follow the use of digitalis where the first consequences of its exhibition were the removal or material alleviation of prominent or distressing cardiac symptoms, whether this has been brought about by its operation as a sedative or as a diuretic." 310.

Remarks on the Pathology of Iritis. By *J. F. France.* (Guy's Hospital Reports, October, 1844.)

Simple iritis, if it ever occur independently of injury, is a mere disease; and the author's remarks are directed to the consideration of the syphilitic and arthritic forms, especially the former, which is by far the most frequent of all. The early and middle periods of manhood are the ages most liable to syphilitic, while elderly persons are more often the subjects of arthritic iritis. In both, the feeble and cachectic are those who chiefly suffer, at least among the applicants at hospitals. The appearance of the iris in the two cases is very different. In *syphilitic* iritis the mobility and the brilliancy of the iris are soon diminished; and before long, at one or more points, its structure becomes tumefied, and its colour changed to a reddish brown. More or less exudation from the aqueous membrane attaches portions of the edges of the pupil to the capsule of the lens. The quantity of fibrin effused into the anterior chamber may be very great. It is, however, in the *arthritic* form of the disease that the lining of the anterior chamber and serous covering of the iris are chiefly affected. A more extensive and considerable dulness is present, and copious fibrinous effusion rapidly ensues. The *entire* pupillary margin soon becomes fixed, and even the whole area of the pupil may be overspread with a white or yellowish effusion. The iris is not partially discoloured in rusty-looking spots, as in the syphilitic form, but becomes uniformly changed to a greenish or yellowish colour. If there is tumefaction, it is also general. In the one disease the serous coverings of the iris are especially affected; in the other, its parenchymatous structure.

The tuberculated and discoloured condition of the iris have been erroneously attributed to depositions of lymph on the free surface of the iris; but, if the eye be closely and repeatedly examined, the tumefaction will be found to arise from the swollen state of the membrane itself, caused by interstical deposition. The reddish colour is produced by the ramification of vessels, containing red blood, in the aqueous membrane over the inflamed points. The dilatation of these minute vessels must reach a certain point before this cause of the red colour can be detected.

"In moderately severe cases this soon takes place; and, if then, the eye be inspected closely in a good light, and with the assistance of a powerful lens (the cornea and aqueous membrane being clear, and photophobia not great) sometimes only one or two, but occasionally a complete net-work of vessels become manifest, ramifying over the swollen parts of the iris, and evidently imparting to them the rusty red colour which they exhibit. The appearances I now describe may be detected in so large a proportion of cases where this dusky colour is developed, that I cannot doubt that the same hue arises from the same

cause, when from the mildness of the attack, and the consequent slighter vascular distention, the individual vessels elude observation; or intolerance of light forbids that close examination and exposure of the globe which are necessary, in most cases, for their recognition In some rare cases these vessels are so gorged, crossing over a well-grown tubercle, that the naked eye can scarcely fail to notice them; in such instances they have in fact been observed, and been ascribed to organization having taken place in lymph thrown out into the anterior chamber from the free surface of the iris."

Eighteen cases are adduced in illustration of the various points laid down; and the author concludes a very good paper with some judicious remarks upon the *treatment*. Among the patients at Guy's, general bleeding is never, or very rarely, resorted to in *syphilitic* iritis, an effectual impression being usually made with facility by means of cupping and purging. After this, mercury is given, in such doses and forms as may seem most applicable to the case, the object being to affect the mouth, or cause recession of the disease. Oftentimes, in the cachectic, sarsaparilla and the iodide of potassium must be given even during the mercurial course. Hyosciamus is preferable, as a combination with mercury, to opium, which favours contraction of the pupil, adding chalk if purging comes on. Mild doses of the mercury are required long after the more active symptoms have subsided, and are then compatible with tonics and improved diet. Blisters are useful when cupping can be carried no farther; and the severe pain in the region of the temple is much relieved by the application of the ung. hyd. c̄ opio. there. Turpentine has not been found useful by the author, and he has been obliged to discontinue it in some cases, owing to its irritating effects upon the kidneys.

In *arthritic* iritis, less vigorous measures are called for. Very moderate cupping, alterative doses of mercury, accompanied by salines and colchicum, are the principal remedies, these last being soon replaced by tonics and alkalis. Extractum conii (gr. v.—x. ter.) often exerts a rapidly beneficial influence upon this disease, even when the inflammation has been very serious. The application of belladonna occasions great suffering in this form of the malady.

A venereal iritis follows occasionally *gonorrhœa*, and then puts on all the characters of arthritic iritis.

ON PARTIAL FRACTURE OF THE NECK OF THE THIGH-BONE. By *T. Wilkinson King*. (Guy's Hospital Reports.)

THIS is another contribution to the *vexata quæstio* of the union of the fracture of the cervix femoris in the aged.

"Surgeons are aware that the inferior part or buttress of the cervix, or that part between the head and the trochanter minor, is by far the most solid. All the superincumbent weight is directed on this part, and thus it would seem its comparative hyper-nutrition is excited or induced. It happens, however, that with general senile atrophy and loss of elasticity and agility, this part is particularly

prone to give way; the head of the bone sinks on the dense shell, and the inferior fragment is driven up into the cancelli of the head. At the same time, less violence is done to the thin elastic shell of the upper part of the neck of the femur, or that between the head and trochanter major. Possibly it is not a very rare event, that in this way fracture extends through somewhat more than half of the neck."

In the case of a man, æt. 72, the bone was divided, with the exception of one-third of the shell, superiorly and anteriorly. Dr. Colles also describes three cases of partial fracture.

"Considering the fact of partial fracture of the neck as sufficiently established, I wish to connect it with the peculiar mode of nutrition of the head of the femur. The artery which supplies the head of the femur, while it constitutes an epiphysis, is persistent through life. It is a large terminal branch of the internal circumflex, which enters a foramen a little behind and below the highest point of the neck of the femur. After this, it curves over the denser layer of cancelli left by the union of the epiphysis to the shaft, directing its course beyond the insertion of the round ligament, to which I doubt not it furnishes nourishment. Now, it is remarkable that this vessel occupies the situation of the greatest immunity from violence; and that, if only a little periosteum about it escape division when complete fracture occurs, it may be left entire to sustain that which I think could scarcely live without it. This consideration seems corroborated by all the examples I have examined of ligamentous union after fracture at this part. Whether there be a re-union by solid ligament, by a few scattered bands, or by a kind of capsule and cell, (all rare events,) I find the course of this vessel apparently uninterrupted." 349.

In reference to the so-called examples of osseous union, Mr. King observes that the fracture has resulted from atrophy of the part as much as from violence; and, as such atrophy continues also after the injury, it is difficult to imagine how ossific re-union should be going on at the same time. He suggests that, in these cases, the fracture may have been only partial; and considers that the facts he adduces, and the collection of specimens at Guy's, only enforce Sir A. Cooper's well-known opinions upon the subject.

He notices that the branch of the circumflex which supplies the epiphysis of the os humeri, is also so protected that a transverse fracture may occur without destroying the continuity of the arterial channel.

PARACENTESIS THORACIS. (Guy's Hospital Reports.)

IN our 81st number, (July, '44,) we gave a copious analysis of the report of Messrs. Hughes and Cock, on the above subject. In the October report from Guy's Hospital, Dr. Hughes has appended some additional cases, of which we shall introduce here a brief account.

Case I.—A man, aged 44, thin and spare, a fish and fruitseller in the streets, had been attacked, a month previous to admission as an out-patient, with pain in the right side, cough, and dyspnœa, for which medicines

were prescribed without benefit. He was afterwards admitted into hospital. The right side ribs did not rise in inspiration—could lie in any position in bed. The physical signs were entire dulness throughout the right side—respiration distant and tubular—no enlargement of side, or intercostal protrusion—no enlargement of liver, or displacement of heart. The exploration showed the presence of considerable fluid. Mercury, diuretics, blisters, &c. having failed, the trochar was introduced, and 30 ounces of clear fluid drawn off, not coagulable but by heat. Ten days afterwards the operation was repeated, and twelve ounces abstracted. The diuretics were now pushed a good deal, and mercury was exhibited.

"He was afterwards again put under the influence of mercury; and being now free from any cough or disturbance of the respiration; being able to lie down with ease; to walk about without inconvenience; to eat, drink, and sleep well; and his principal complaints being of flatulence and palpitation, probably resulting from dyspepsia; the respiration having returned in a great degree in even the lower part of the right side posteriorly, and to some, though a less extent and degree anteriorly, though the whole side was still very dull on percussion, and the voice shrill throughout its greater portion; he left the hospital August 13th, with the belief that he would be improved by air and exercise, and with the promise that he should return if he were not so well. Up to the present date, September 13, he has not since been seen or heard of." 357.

Case 2.—A man aged 34, admitted under Dr. Addison, June 25, 1844. The patient had been a medical practitioner, and first fell ill in Nov., 1842, in New South Wales, with cough, expectoration, emaciation, dyspnœa, &c. In February, 1843, he had hæmoptysis. In July he sailed for England, and arrived in the latter end of November, when the right side of the chest was somewhat bulged out. On admission by Dr. Addison—

"He had a pulse of 120, considerable dyspnœa, and an entire incapability of lying on the left side, or on the back. He had very little cough, accompanied with trifling mucous expectoration, a clean tongue, a good appetite, and was free from nocturnal perspirations. The right side of the chest was then very dull on percussion both behind and before, including the entire length and breadth of the sternum: it was somewhat misshapen, and measured about half an inch more than the left side. Tubular breathing was heard throughout the whole of the right side, excepting immediately below the clavicle and about the spine of the scapula, where some harsh respiration, together with fine but loose mucous rattle, was indistinctly audible. The voice was tolerably resonant over the whole of this side of the chest, and possessed a shrill ægophonic character below the angle of the scapula. The impulse of the heart was felt more than an inch nearer to the axilla than in the healthy state. *The liver could not be felt below the ribs, nor was any sulcus apparent, though both were sought after with some interest.* There existed no general elevation of bulging of the intercostal spaces; but a soft, flat, fluctuating tumour, nearly the size of the palm of the hand, which increased upon coughing, was observed to overlie, and to proceed from between the six and seventh ribs.

"On the left side, dulness on percussion, increased resonance of the voice, and imperfect respiratory murmur, existed in the mammary and hypochondriac regions; and just above and to the outer side of the nipple, over a space the size of a crown-piece, increased dulness on percussion, tubular breathing, imperfect pectoriloquism, and gurgling rattle, were clearly distinguished. The other parts of the left side presented nothing abnormal; and the heart, with the exception of its being displaced, appeared healthy." 259.

On exploration, the left cavity of the pleura was found to contain much fluid, and the trochar was introduced, when 24 ounces of fluid were evacuated by Mr. Cock, in a full stream, 27th June. From imprudent exertion, some hæmoptysis was occasioned, and was checked by super-acetate of lead and hyosciamus. He was ordered iodide of potassium with sarsaparilla, and sent into the country. July 15th. Returned, and paracentesis was again performed on the 16th, by Mr. Cock, and 36 ounces of fluid withdrawn in a full stream, with great relief to the breathing, Pil. hyd., ext. hyosciam. and liq. potass. were ordered. He left the hospital again, and returned on the 30th July.

"A very gratifying change was now apparent. The girth of the chest measured at least two inches less than formerly, the decrease being nearly equally divided between the two sides. He could lie and sleep without difficulty, on the back and left side; his health had much improved; his tongue was clean; and his breathing comparatively easy. The entire sternum remained resonant upon percussion; and the upper part of the right side, nearly as low as the nipple, had regained its sonorousness. The vesicular murmur was audible in the right side posteriorly, and, though mixed with mucous rattle, and harsh in character, as low as the nipple anteriorly. The right side expanded, upon inspiration, nearly as fully as the left; the dulness, gurgling, and resonance of the voice above the left nipple had almost entirely disappeared, the particular space being indicated principally by a little muco-crepitating rattle; and the impulse of the heart was felt in nearly its normal site." 361.

He left the hospital soon afterwards.

Case 3.—A lad, aged 18, was admitted on the 31st July, 1844. Became affected with pain in the chest eight months previously, and in March last was obliged to give up work as a painter. Upon admission he had pain in the left side—pallid countenance—tongue clean—bowels irregular—respiration 42—pulse 120, feeble.

"The physical signs presented, on examining the chest, were, dulness on percussion as high as the fourth rib on the left and the sixth rib on the right side anteriorly, and at the angle of the scapula on the left side posteriorly. The respiratory murmur was defective, or distant on both sides at the lower, and puerile on both at the upper parts of the chest. Increased resonance of the voice existed over the whole chest, except at the inferior part of the left side before and behind. A little pleuritic rubbing or creaking was heard, together with shrill bronchophony, along the outer edge of the lower part of the scapula. The apex of the heart was felt most distinctly to strike the parietes between the fourth and fifth ribs, below and rather to the inner side of the nipple: its impulse was feeble; its sounds were triple. There appeared, indeed, to be a double first sound. The rhythm may be thus represented—tic-tic—tac; tic-tic—tac. Its abnormal character seemed to be probably connected with effusion between the pleura and pericardium." 363.

On the 1st of August the explorator was introduced, and a few drachms of clear fluid followed. Opium and quinine—liq. potassæ. On the 14th August another operation was performed, and seventeen ounces were drawn off. A flannel bandage was applied. On the 20th August,

"The chest measured one and a half inch less than before, almost the whole of which was dependent on the decrease of the left side. He now lay upon the right or left side with equal facility; had no cough; and had much improved

both in flesh and appearance since his admission. His respirations were 36 in the minute, and his pulse 112, but still very feeble. This day, Sept. 7th, he has been again examined. He makes no complaint, excepting of the soreness of a blister recently applied: the tongue is clean, the respirations 22 in the minute, but the pulse still numbers 112 to 120, and is very feeble. The left side is throughout resonant upon percussion, and the respiratory murmur can be heard in every part, the only abnormal circumstance discovered being a little pleuritic creaking, resulting from adhesions. The triple beat of the heart, also, has disappeared. As he seems now to be suffering more from debility and confinement than from any remains of his complaint, he has been advised to go into the country for change of air, on Monday next, the ninth instant, with a desire that he shall present himself for examination upon his return to the neighbourhood of town." 364.

These and the cases previously reported, show that paracentesis seldom produces any inconvenience, and often gives great relief—perhaps preserves the life of the patient. The authors of this remedial means richly deserve the thanks of their brethren at large, not only for their courage and candour, but for rescuing such valuable facts from the dark records of hospital books, where important information too often lies in oblivion. We hope the time is fast approaching when these treasures of practical knowledge will be regularly laid open to the public.

GENERAL THERAPEUTICS AND MATERIA MEDICA. By *Robley Dunglison*, M.D. Professor of the Institutes of Medicine, &c. Philadelphia, 2 vols. 8vo. 1843.

It is gratifying to all those who were personally acquainted with Dr. Dunglison in Modern Babylon, to find that he has distinguished himself in the far-West, and carried to his new and adopted country, talents and acquirements that would have insured him success and reputation even in this over-stocked land of literature, science, and art. Emigration is not confined to the labourers in the field, mechanics in the work-shops, or artists in their atteliers. The paths to fame and fortune, in these isles, are so densely crowded—so long and tortuous—so steep and rugged—that many of the climbers either faint by the way, or despond and give up the attempt—while few, comparatively, reach the goal of ambition, wearied and damaged by the toilsome ascent. No wonder, then, that some of our brethren cross the Atlantic, in search of a wider theatre, a freer air, and a less densely crowded field for the exertion of their talents and industry.

The work before us is divided into two Parts—THERAPEUTICS and MATERIA MEDICA. The author modestly designates it as "a text book" for students—but we are all students, during the whole of our career, and not a few of us require a fillip to our memories—a new wrinkle in our horns—and the frequent rehearsal of old lessons, from time to time. Still the volumes are essentially elementary, and consequently adapted particularly for the student—though the full-grown practitioner may often glean from them new facts as well as original ideas. As an elementary work, it

is insusceptible of analysis, and we can only introduce to our readers a few specimens of the style and matter of which it is composed, in order that they may form some judgment of its execution. Speaking of Prejudices, Dr. Dunglison remarks that:—

"A prejudice is still found, however, against the use of iced water in fever where calomel is given. The feeling exists strongly in many parts of the Southern and Middle States, but it is rapidly yielding, and ought to be altogether abolished. Some cases have occurred in which individuals have caught cold, or have had disagreeable symptoms supervening, after cold water has followed calomel; but they have been cases of the *post hoc*, rather than of the *propter hoc*. The author has been for years in the habit of allowing the use of iced water after calomel in fevers, and has never had the slightest evidence of any disagreeable results from it." 58.

We have never hesitated to apply ice to the head, when the brain is affected, whatever calomel may be introduced into the stomach; and we have rarely found that cold drink produced griping or other inconvenience, during the use of mercury in fevers.

The doctrine of Homœopathy does not appear to captivate the senses of our author, no more than Mesmerism.

"One of the strangest of the assertions of Hahnemann and his followers is—that homœopathic medicines acquire at each division or dilution a new degree of power, by the rubbing or shaking to which they are subjected, 'a means,' says Hahnemann, 'of developing the inherent virtues of homœopathic medicines that was unknown till my time; and which is so energetic, *that latterly I have been forced, by experience, to reduce the number of shakes to two, of which I formerly prescribed ten to each dilution*." 82.

What tremendous powers might thus be called forth by *agitation!* Daniel O'Connel has evidently caught the idea from Hahnemann, and has determined to shake the Repeal question till it overpowers and lays the Saxon in the dust!

Speaking of the therapeutical agency of Nauseants, Dr. D. remarks:—

"In *constipation*, a union of nauseants with cathartics becomes occasionally advisable, and at times effectual, after cathartics alone have been unsuccessfully employed. If the constipation be dependent upon any irritated condition of the exhalents of the canal, the use of debilitants,—such as those now under consideration,—reduces the erethism, and facilitates the operation of the purgative. Whenever, too, it is desirous to break in upon a morbid chain, and especially in the neuroses, nauseants may be beneficially administered: but, in these cases, the revulsion, induced by a nauseating emetic, is generally preferred, in consequence of the more powerful impression which it makes on the nervous system." 92.

Small proportions of tartrate of antimony, combined with colocynth and the pil hydrarg., we have been long in the habit of using in the obstinate constipation of bowels that too often accompanies dyspepsia and torpidity of liver.

Enemata.

That Dr. Dunglison and nine-tenths of the profession labour under erroneous notions as to the physiological, medicinal, and mechanical effects of enemata, we have had ample opportunities of knowing.

"When thrown in contact with the lining membrane of the *rectum* they irritate it; and by sympathy of continuity, their influence is extended to the upper portion of the tube. Hence, they may be administered with advantage, when cathartics cannot be easily given by the mouth, as where deglutition is impracticable." 139

Now we know, from twenty-five years of personal, as well as general experience in regard to enemata, that it is not merely by *sympathy*, but by general distention of the colon—sigmoid flexure and transverse arch—that the effects of enemata are produced. Of what use would be a few ounces of fluid, to distend the rectum? None at all. Besides, the rectum is not really distended till nearly the close of the operation. The fluid ascends into the transverse arch of the colon much more easily than it distends the strong muscular tube of the rectum. Any one who is accustomed to use the syringe, will feel the fluid, after two or three strokes of the piston, run along the transverse arch, and when that portion of the bowel is filled or excited into contraction, the rectum is distended, and the enema can no longer be retained. The best mode of using a lavement is to put two or three pints of warm water into a basin—wash the hands with Windsor or other soap—and then pump the soap-suds gently and slowly up the gut, till re-action takes place, and the enema and fæces are discharged. It is all very well for the French lady, or the English invalid, to throw up a pint or so of warm water, and then lie down for an hour or two to knead the bowels and push the fluid about in the colon. But the lawyer, the merchant, the doctor, or the man of business, cannot go through this tedious process, and must use the summary one which we have described—and which, after all, is the "cito, tute, ac jucundo" operation.

We can only spare space for one more quotation, and that is from the second volume, under the head of "BLOOD-LETTING," upon which important therapeutical agent Dr. Dunglison has made many judicious and important remarks.

"It may be laid down, perhaps, as a general law, that when blood is lost to a considerable amount, the great nervous centres receiving an inadequate—and the rest of the nervous system an irregular—supply, their excitability becomes largely and irregularly developed, so that, under this impressible condition of the nerves, the blood-vessels, whose functions are carried on under their presidency, assume augmented action; and if, owing to the previous existence of hyperæmia in any organ, the nerves, proceeding to that organ, are in a morbidly excitable condition, a fresh development of excitability may ensue after the bleeding, and the hyperæmic condition, instead of being relieved by the loss of blood, may be augmented by it. In individuals, whose nervous system is very impressible, the same effects may be induced by a full bleeding, as have been described to result from excessive discharges from the uterus, and, accordingly, where hyperæmic conditions occur in such individuals, the practitioner is cautious in the use of the lancet, and if he employs it, he does not carry the depletion so far as to depress too much the powers of the system,—aware, that if he should do so under the nervous irritability or neuropathia, which he develops, re-action might succeed to such an extent as to reproduce the exaltation of organic actions in the part, and perhaps to a greater degree than before the operation. It is in such impressible habits that advantage is found in the adoption of other sedative agents; and that a combination of blood-letting, short of inducing syncope, with a full sedative dose of opium, is often so serviceable;—the bleeding diminishing the exaltation of the vital manifestations, by acting on the nerves through the blood-

vessels; and the opium preventing the subsequent development of nervous excitability. In strong individuals, the same plan, pushed to a still greater extent, is equally successful and not the less philosophical, when employed for the removal of internal inflammations. It is the plan which, as before observed, is adopted with so much success, in acute peritonitis;—the bleeding being carried so far as to make a decided impression on the system, and the opium administered in a full dose; a sedative influence is thus exerted on the body generally, and on the inflamed tissue in particular, under which the hyperæmia is effectually subdued." 151.

Our junior brethren in America will find in these volumes of Dr. Dunglison, a "THESAURUS MEDICAMINUM," more valuable than a large purse of gold.

LECTURES ON OSTEOLOGY, INCLUDING THE LIGAMENTS WHICH CONNECT THE BONES OF THE HUMAN SKELETON. By *B. B. Cooper*, F.R.S. Highley, London, 1844. 8vo. pp. 270.

THIS work, a second and improved edition of Mr. Bransby Cooper's first volume of "Lectures on Anatomy," furnishes a very good description of the various bones and joints of the human skeleton; the different accidents to which each part is liable, and the most appropriate means of relief, being concisely stated in smaller type at the foot of each article. Practitioners of medicine forming the great bulk of our readers, the noticing a production intended as a class-book for students may seem somewhat out of place: but we do so for two reasons. In the first place, a young man naturally consults his seniors in the profession as to what books he had better purchase; and, seeing the tempting variety offered to his notice, and the limited means frequently at his disposal, we think he only acts prudently in so doing. But, secondly, and chiefly, because we think this is one of a class of books a practitioner should consider himself responsible for all pupils committed to his care, being familiar with the contents of prior to the expiration of their pupilage, and the formal commencement of their studies at the schools. This is a very important matter, but we believe the discussion of it comes almost too late. The days of the apprenticeship system are numbered. But why? Not so much from any inherent rottenness in the thing itself, as from the neglect of those who have had the working of it out, in not having allowed it to participate in the spirit of modern improvement. Formerly, when the apothecary was the mere humble attendant upon the physician, and when the careful preparation of the complex forms of prescription then in vogue, constituted the great object of his existence, an apprenticeship passed in culling simples, and in pestle and mortar slavery, seemed not very unreasonable, especially as the act of dispensing was necessarily a more tedious and difficult matter than at present. But, after the apothecary had succeeded in elevating his position in the profession to that rank which the general practitioner now occupies, it became a gross and palpable inconsistency on

his part still to limit the instruction of his pupils to mere pharmaceutical matters, and to neglect preparing them for that wider sphere of activity and usefulness which had been opened out to them. It is a subject of daily complaint that the curricula of the examining bodies compress so large a quantity and great a variety of requirements within so short a space of time. They, however, have no option if they wish to maintain the present high standard of professional education, and yet not preclude young men of comparatively limited means from endeavouring to attain it. The only mode of diminishing the inconvenience is for students to commence their attendance upon the various lectures in a better state of preparation than they do at present, and which it is impossible for them to do, as long as the mere compounding of medicines forms the chief employment of their apprenticeship. Under any arrangement much must remain to be done in London, for which the time allotted is barely sufficient; but when this time is trenched upon by commencing learning that which ought already to have been acquired, the case often becomes desperate, the bewildered student, harassed and frightened by the multitude of objects which are demanding his attention, throws himself into the arms of the *grinder* as his deliverer, and spends hour after hour in repulsive, mechanical, parrot-like labour, disgusting himself with studies, which, judiciously conducted, possess unequalled attractions, and losing the opportunities which his residence in a large capital can alone afford him, of observing examples of disease under every possible variety of circumstance.

During his apprenticeship the pupil should have the facilities offered him of obtaining a general idea of the structure and functions of the frame, and a complete knowledge of the bony portions of it. Of Chemistry, Materia Medica, Natural Philosophy, and Botany, by the aid of some of the excellent works now published, he might also acquire all the outlines. Thus informed, he arrives at the schools fit and ready to make the most of his opportunities; and when there, Practical Anatomy and Chemistry, and the minute and constant Observation of the Sick, become to him improving and interesting occupations, and should indeed chiefly absorb his attention. Many practitioners, we are aware, afford these facilities to their pupils; but that the great bulk do not, the very ignorant condition which many young men arrive in, and the consequent loss of time they incur, is a sufficient proof. Did all do so, there could be no solid objection to apprenticeships; for no one wishes young men to be empowered to enter the profession at an earlier age than they do at present; and where could they so well pass the three or four years intervening between their leaving school and commencing attendance in the large towns, as under the careful inspection of one already versed in the knowledge they seek to attain, and willing to afford them assistance and instruction?

To revert to Mr. Cooper's book: we have only to state that the decriptions of the various bones and joints are very complete; while the surgical observations appended are sufficiently so to point out to the student the practical bearings of the subject—thus at once showing to him the importance of the study he is engaged in, and relieving, in some degree, the tedium of its pursuit. One or two of these we may extract.

"*Treatment of Fractures.*—Immediately after fracture of any bone, when there is a tendency to great tumefaction, it is wrong to apply either splints or

bandage, for any restriction of swelling is liable to produce gangrene: under these circumstances, the limb should be placed on a pillow in a semi-flexed position, so that the muscles may be perfectly relaxed, and the bones placed as nearly as possible in their natural position; which circumstances may be ascertained, whatever may be the swelling, by the immediate comparative ease of the patient. An evaporating lotion is then to be used; or should there be any tendency to involuntary contraction of the muscles, strips of soap plaster may be gently applied around the limb, which, by causing a secretion beneath it, diminishes the irritability of the muscles, as well as the urgency of the inflammation. If it can be avoided, purgative medicines should not be given, as they would produce a necessity for frequent change of position: but should their use be considered essential, such medicines are to be given as are least likely to keep up a continual action on the bowels. As soon as the tumefaction and inflammation have subsided, which, under the treatment recommended, generally happens in three or four days, well-padded splints should be applied, and retained in their situation by broad pieces of tape resting firmly on the splints, but which should not be anywhere in contact with the limb.

"It has been stated, that a bandage should never be applied immediately after the occurrence of fracture: however, it may be considered as an exception to this rule, that when a portion of fractured bone has wounded and irritated a muscle, a bandage is the best means of relieving its spasmodic action. When fracture of a bone happens in the neighbourhood of, or passes into a joint, local bleeding, by means of leeches, is always necessary, and may require to be frequently repeated: even the necessity for general bleeding may sometimes be indicated, when there is much constitutional irritation: in which case, calomel and opium will also be found of the greatest service. In fractures into joints, when inflammation becomes so violent that the surgeon sees that anchylosis must necessarily occur, the joint should be placed in such a position, as to render the limb as useful as possible. Under these circumstances, for instance, if the elbow-joint be the one affected, the fore-arm should be semi-flexed; by which position the patient will afterwards be able to feed himself. In the knee-joint, the leg should be very slightly flexed upon the thigh; by which method he is better able to direct the foot, and the limb is rendered more manageable in the sitting posture. In the ancle-joint, we should endeavour to procure a union with the foot perfectly flat; whereby the patient will afterwards enjoy very considerable use of his limb."

Among the observations upon *Diseases* of *Bones* we find the following:—

"Bones fall more slowly into disease than the softer parts, and their restoration is proportionally more tardy; they receive their nutriment chiefly from the periosteum; and hence it is, that disease or injury to that membrane immediately affects the bone itself—a circumstance that should ever be borne in mind by the surgeon when operating upon bone; for it is scarcely possible that any very extensive destruction of periosteum can occur without exfoliation of the bone itself.

"The inflammation may be either acute or chronic, common or specific, and the strict antiphlogistic discipline, and counter-irritants, are the remedies to be adopted; with a severity to be regulated by the power of the patient's constitution. Calomel and opium will be found particularly useful when the pain is very urgent. It may be remarked, that the increase of pain at night is one of the diagnostic marks of the inflammation of bone, whether it be affected by simple or specific action; although it is too generally considered that the nocturnal pains indicate syphilitic affection, when, on the contrary, it seems to be concomitant with inflammation of bone from any cause. When the inflammatory symptoms have been relieved, or it has terminated by what is called resolution, a thickness of the inflamed bone remains, usually for a considerable time, from

the difficulty there appears to be in the absorption of the adventitious earthy parts.

"When the inflammation goes on to the formation of matter, suppuration is indicated by symptoms similar to the formation of matter in soft parts, although there is somewhat more difficulty in deciding upon it, as no external marks at first present themselves; but rigours, with an increased sense of weight of the diseased part, and a remission of the severity of the pain, will usually lead to a just diagnosis. But in abscess, the part of the bone affected soon becomes swollen, its periosteum becomes thickened, caries supervenes, and the matter is discharged by a process similar to the discharge of matter from soft parts; but the progress and reparation are slower."

Accidental Ossification is thus described:—

"There are certain of the soft structures of the body, which are liable to accidental or unnatural depositions of bony matter, as the dura mater, pericardium, and even muscle. It generally happens, however, that the proportions of the animal and earthy parts are not the same as in the original bone. These deposits being sometimes as hard and polished as the enamel of the teeth, at other times soft and cretaceous, resembling moistened chalk. The former are most common in serous membranes, whilst the latter are not unfrequently met with in abscess of the lungs, in the uterus and ovaria."

Application of the Trephine.—"If there be a wound communicating with the bones of the skull, accompanied with fracture and depression, in such cases, although no untoward symptoms have as yet arisen, we are recommended immediately to trephine; but of the propriety of this step there seems to me some doubt. We should rather be led to judge of the necessity of the immediate application of the trephine by the *degree* of depression, and by the *part* of the skull injured; for as the quantity of diploe differs so much in different skulls, there is no evidence of the brain being injured until symptoms supervene; and I would therefore recommend that the patient should be most narrowly watched, and that the trephine should not be applied until symptoms point out the necessity. When compression arises from the formation of matter, which, as already mentioned, does not come on until some time after the accident, the surgeon is placed under the greatest difficulty to discover the precise seat of the injury, as it is not always at the part where the blow was inflicted. To ascertain this essential point, the scalp must be most carefully examined, and if a puffy appearance be found opposite to the part where the matter is situated, an incision is to be made through the part of the skull exposed, which will be found denuded, or at any rate its pericranium easily separable from it; the bone itself will be of an ash-colour, without any tendency to bleed. These circumstances will prove that you are justified in removing this portion of bone. I have seen my colleague, Mr. Key, under these circumstances, perform this operation with perfect success as far as relates to the evacuation of the matter, although the patient did not subsequently recover, in consequence of the extent of injury the brain had sustained."

The principal fractures are illustrated by lithographs.

THE PHYSIOLOGY OF INFLAMMATION AND THE HEALING PROCESS. By *Benjamin Travers*, F.R.S. 1844. 8vo. pp. 226.

TREATISE ON INFLAMMATION AS A PROCESS OF ANORMAL NUTRITION. By *John Hughes Bennett*, M.D., F.R.S.E. 1844. Octavo, pp. 80.

FROM the period of the researches of Hunter to the present day, the subject of inflammation has proved one of surpassing and abiding interest. That this should be the case can excite no surprise; for, while a correct theory of its production may amend or confirm many of the views of the physiologist, and clear up some of the numerous obscurities which beset the path of the pathological inquirer, the mere practical man, in deriving hence a knowledge of the true principles upon which its treatment should be based, becomes the possessor of by far the most powerful instrument for the relief of disease. It is true that the crude and exaggerated notions, according to which inflammation forms the basis and point of departure of all diseases, have done infinite mischief, not only by the ultra-depletory practices they encouraged during the day of their prevalence, but also by reason of opposite errors which have resulted from the re-action consequent upon their explosion; and yet the justice of Mr. Lawrence's statement, that few indeed are the diseases in which the inflammation of some organ is not a cause, effect, or concomitant circumstance, must, we think, be at once acknowledged. Indeed, the very generality of the prevalence of inflammation, and the great variety of conditions under which it manifests itself in the economy, have led celebrated observers, as Andral, Magendie, &c., to repudiate the term as vague and inexpressive. Certain phenomena, however ill-expressed, are well-understood by this word, that are by no means represented in Andral's term *hyperæmia*, which labours under the disadvantage also of expressing a state which may exist independently of inflammation. "Hence," says Drs. Alison and Bennett, "it has been the object of British pathologists to give precision to the old term inflammation, rather than change it for another, perhaps more unsatisfactory." Investigations into the intimate structure of the various organs, and the anormal processes they are the subjects of, have been wonderfully forwarded in our times by means of the microscope, whose improved construction necessarily preceded any great advances in this direction. "It is remarkable, and at the same time conclusive of the soundness of Mr. Hunter's doctrines of inflammation," says Mr. Travers, "that the additions thus made to the illustration of this great subject of his researches, though materially affecting details, so far from invalidating, tend strongly to confirm the general principles which he has laid down, to carry out the views which he entertained, and to embody those which he left in shadow."

We have to apologize to our readers for having left Mr. Travers's book so long unnoticed; the productions of his pen have been few but valuable, and anything original in this age of book making compilation is indeed acceptable. The present work is not likely to diminish his reputation, giving, as it does, an able description of the various phenomena attendant

upon inflammation, and a succinct account of the progress of the healing process observed under the microscope in many experiments. Dr. Bennett, in the pamphlet, the title of which we have also placed above, endeavours, and we think with great success, to point out in a more distinct manner than has hitherto been done, what are the essential phenomena of inflammation, and to show the connexion of these with a perversion of nutrition, explicable by the cell theory. To present a complete analysis of works themselves so condensed would not be a very profitable labour, and we shall therefore notice only in each such portions as present most novelty and interest.

The Capillaries.—Upon these Dr. Bennett offers some interesting observations. Blood-vessels examined by the naked eye seem to consist of but three coats; but Henle has shown that in fact they are distinctly divisible into six layers, of each of which the intimate structure differs in arrangement. These coats diminish in number as the vessels approach the periphery, but even very minute ones continue to possess three of them. At length, in the true capillary or intermediate vessel, only one exists, consisting of a firm, transparent membrane, without the smallest opening, and thickly studded with variously-shaped nuclei.

"In the numerous demonstrations I have made of these structures, I was struck with the resemblance which the capillary vessel presented to the fibres of non-voluntary muscles. I subsequently discovered that, if the mucous coat be carefully removed from a portion of intestine, (say in the rabbit,) and the remaining structure rendered transparent by acetic acid, a longitudinal and transverse coat, with longitudinal and transverse lines, formed by elongated nuclei. are apparent as in the coats of arteries In short, the two structures in some demonstrations were so similar, that I should have had some difficulty in recognising one from the other, were the microscopic examinations alone attended to. Repeated examination of this fact, as well as numerous observations on the organic muscular fibre, have led me to the conclusion, that no structural difference exists between what is called the muscular coat in the intestines, and that constituting the third and fourth layers in arteries, as previously described. Neither does any essential difference exist between these last and the ultimate texture of the capillaries. If this opinion be correct, then it will be natural to suppose that their function is also similar.

"The term muscular fibres, as applied to this structure, gives rise to very erroneous notions. Persons naturally conceive that some relation exists between voluntary and non-voluntary muscle, whereas, no two elements can be more distinct. The fibres seen running longitudinally and transversely, as on the intestinal coats, the fibres of the bladder, stomach, &c., have no analogy whatever with the striated fasciculi of voluntary muscle. Their mode of contraction, also, is perfectly unknown. The fact, however, viz. that the structure hitherto called non-voluntary muscle is the same in the contractile coat of the muscles and intestines, the middle coat of the arteries and in the capillaries, leaves very little doubt in my mind, that the vital contractility possessed by all these tissues is the same, and dependent upon the same causes." 26.

Of the *Functions* of the capillaries it is observed—

"The more specific office of the capillaries and intermediate vessels is evidently, 1st, so to subdivide the blood that it may reach every portion of the organism, and enable its corpuscles to perform their function; 2d, to offer a membrane by means of which exosmosis and endosmosis may be effected.

What the connection may be between the vital properties of those vessels and the exudation of blood-plasma it is difficult to determine. We may remark, however, that the delicate homogenous structure they present, admirably fits them for acting as fine filters subjected to vital laws, retaining the solid corpuscules and granules, and allowing only the fluid portions to transude. How far the circulation is influenced by the contractility of the capillaries is still a matter of inquiry.

"From these considerations, the importance of the capillaries, as connected with nutrition, will become apparent. So long as they only permit that amount of blood-plasma to exude which is capable of supplying the quantity dissipated by waste, so long they may be considered as performing their functions in a normal manner. But when circumstances induce such a change in them that the amount of exudation is materially diminished or increased, then an *anormal* state is occasioned. If the amount be diminished, atrophy will be produced, if it be increased, that peculiar pathological change, hitherto denominated *inflammation*, is constituted."

Direct effects of Stimuli and of Wounds.—Mr. Travers presents the following brief summary of appearances observed, and which were alike produced, whether the experiments were performed by the application of any stimulant substance, as salt or ammonia, or the infliction of a wound.

"The first effect of a drop of stimulant fluid, or of a wound upon a transparent web (frog's foot), as seen in the field of a powerful microscope, is to arrest the circulation at the part. Around the point of absolute stagnation the column of blood oscillates, and the particles are seen to separate and congregate in small irregular masses, presenting varieties of shape, some being perfect ellipses, others spherical. The vessels are dilated, and in proportion their fulness is increased and their pink colour heightened. Still more remote from the stagnant centre, increased activity of circulation prevails. The point of stagnation—the very slow circulation in the part immediately surrounding it, the current still oscillating in parts—and beyond this the more rapid and vigorous circulation, are manifested for several days. The contrasted appearance of one portion of the web stationary, and another in brisk circulation, is striking."

In a period varying from ten to twelve days, this condition of congestion of the parts disappeared, and the circulation became established over the whole web.

Theory of Inflammation.—Where the stasis of the circulation, however, is produced by a more considerable irritation, the distended vessels relieve themselves, either by rupture and consequent hæmorrhage, the effusion of serum, or the exudation of the *liquor sanguinis* or plastic element of the blood. Dr. Bennett attributes these early phenomena of the inflammatory state to a vital contractility and consequent relaxation of the capillaries, analogous to, if not identical with, spasm and paralysis of muscle; and to an increased attraction between the corpuscules of the blood and the surrounding parenchyma, by virtue of which these approach from their natural position in the centre to the sides of the vessels.

He also regards the *anormal exudation of the liquor sanguinis or blood-plasma as the essential phenomenon of inflammation.* That *effusion* frequently occurs independently of the inflammatory process, is familiarly known; for example, in various forms of dropsy of the limbs. It may

also precede or accompany the true inflammatory exudation, but is quite distinct in its nature. "The effusion of serum under compression," observes Mr. Travers, "œdema, or lesion, devoid of blood particles, as in sprain, is to be distinguished from the effusion of *liquor sanguinis* in wound and inflammation:—the former being the albumineo-aqueous and saline compound, forming the serum of the blood; the latter, the fibrinous constituent separated either from the effused *liquor sanguinis*, or within the inflamed vessels; the last alone being susceptible of permanent organization.

Dr. Bennett thus, too, endeavours to account for the distinction.

"Why it should happen that venous congestions are never accompanied by an exudation of blood-plasma, whilst arterial congestions are, is a point that no one yet has endeavoured to explain. To me it appears certain that all inflammatory effusions occur through the capillary or intermediate vessels, and not in such vessels as may properly be called arteries or veins. The vein is a very composed structure, and when distended to the utmost only permits the more fluid portions of the blood to pass through. The capillary vessel, on the other hand, is a most simple structure and exceedingly delicate, so that when distended we may readily understand that it admits not only the serum but the more inspissated *liquor sanguinis* to pass through also. But it is scarcely possible to suppose that the mechanical difference in the tenuity of the filtrating membrane should constitute the only distinction. It is impossible to reconcile the phenomena without having recourse to some active vital power of attraction between the blood and parenchyma, as formerly explained; a power which, operating in the one case and not in the other, causes different constituents of the blood to become exuded. We are compelled, in all our considerations of the subject, to go back to this explanation, as to an ultimate fact." 39.

The exudation of *blood-plasma* is then the only positive proof we have of the existence of inflammation; and the want of a recognition of it as the essential phenomenon has surrounded the descriptions of the disease with vagueness and inconsistencies. Thus, even in Mr. Travers's present work, he enumerates heat, redness, pain, and swelling, as the local symptoms of inflammation, any one or more of which may yet be absent; and when present, serve in part rather to characterize the preceding congestion than the inflammation itself; while he treats of the exudation merely as one of the effects or results of inflammatory action. A confusion of ideas upon the subject has led also Dr. Macartney to state that the presence of inflammation is opposed to the healing of wounds, while Sir A. Cooper maintains that this is impossible in its absence.

Constitutional Symptoms or Effects of Inflammation on the System.

We transcribe some of Mr. Travers's excellent observations upon this subject.

"When the local inflammation is in such organs or of such amount as to rouse the system, this partakes (?) of the inflammation. The blood undergoes changes in passing through inflamed vessels which affect its natural properties. The brain and nerves become preternaturally excited by it, the functions of the entire digestive apparatus and of respiration are hurried and imperfectly performed; consequently the excretions are altered in quantity and in quality, and the vitiation of the blood increases from the suspension of the relief derived from its habitual and required issues; for what the blood in its circulation parts with, is as essential to its health as what it gains. Meantime the inflamed part undergoes

changes very typical of those which the system indicates. No approach towards healing is ever seen in such a state of the system. The degree of fever, the seat and the symptoms of the inflammation, must be taken as the index and measure of the changes which are wrought in the part. If the adhesive or granulating process has not commenced, it is prevented; and if it be in progress, it is destroyed. The ulcerative process becomes utterly indolent and ill-conditioned, or it passes into gangrene. The changes, more or less, are all on the losing side. The whole system is inflamed (?), and the local malady and its cure are merged in the general malady and its treatment. It is almost ludicrous to observe the nice distinctions and refinements of the ancient, and even of some modern surgeons, in the selection of local applications, when the parts take so subordinate a share of the disease, or are so far beyond reach of treatment by local remedies, as to be scarcely susceptible of good or harm. It is like galvanizing the muscles to restore life to the exanimate system.

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"In inflammations which are set up by grave injuries, the system, if not at once disabled or in some way disordered along with the parts, is frequently predisposed to an earlier sympathy, induced by the shock which it has at the same time sustained. This sympathy constituting 'irritation,' is often of a more dangerous description than inflammatory fever, as I have elsewhere fully explained.*

"On the other hand, many inflammations having a very slight beginning, as regards their exciting cause, seem to owe their unmanageableness, and rapid transition from bad to worse, to a previously diseased or worn-out habit of body, and the typhoid diathesis prevailing in such circumstances. Some indeed originate from this cause independent altogether of local injury—such cases are always of serious aspect. But in favourable circumstances, of which youth and temperance are the foremost, the sympathetic inflammatory fever gets up gradually even after severe injuries, and evinces no more than what must be regarded as the unavoidable, nay, the gratifying proof of universal and salutary consent between the whole of its parts; and the career of inflammation towards the accomplishment of the purposes to which it is instinctive is but little retarded." 56.

Among the remarks upon *Blood-letting*, we select the following:

"The choice of measures, *i. e.* local or general blood-letting, is determined, partly by the relation of the parts affected to the centre of the circulation, and in part by the more or less urgent necessity that exists for disembarrassing the general functions, and arresting destructive inflammation. In visceral inflammation, venesection is indicated and warranted to the utmost extent that the powers of life will bear; for here the mass of blood is so altered and spoiled for its proper and healthy purposes by the direct implication of the blood-making and blood-preparing organs in the disease, that relieving the system of its presence to the extent that can be borne, is the main resource we possess for its preservation. As we would remove a poison, a *materies morbi*, in such cases we take away blood. Its altered condition is palpable when eliminated from the body; it undergoes a peculiar separation of its parts, and presents other appearances not manifested by healthy blood. The difference of the blood within the vessels from that of health, is not less, if we could fully appreciate it. If inflamed blood be transferred into the vessels of a healthy animal of the same species, as his own is withdrawn, instead of supporting, it rapidly destroys life. A freer circulation through the smaller vessels, and those of the excretory glands especially, ensues

* Inquiry concerning Constitutional Inflammation, 1827.

almost immediately upon a full blood-letting: the sense of overwhelming oppression is relieved, and the inflammation, if not abridged by its effects, is disposed to a kindlier termination.

"There are two false doctrines concerning blood-letting for inflammation, which cannot be too strongly condemned. the first, anticipatory blood-letting, by which I mean, the large and repeated detraction of blood before inflammation being considered inevitable, has actually manifested itself—on the hypothesis of starving the action, and thus rendering it tractable—which is a direct attack on the vitality, and fatally prevents the action, if it do not destroy the resisting powers of the system. The second, continuing the employment of the lancet so long as the last-drawn blood exhibits the signs of inflammation, which if drained to the last drop it would do; or, in other words, not reflecting that there is a line beyond which the practice becomes destructive instead of remedial; and that there are many inflammations which do not admit of arrest by depletion, and upon which other modes of treatment are efficient to this end, even though not an ounce of blood be drawn. Many lives have been sacrificed to the prevalence of these irrational and absurd notions, and many preserved in their extremity by being fortunately placed beyond the reach of the surgeon; especially, I am induced to believe, in military practice." 59.

Terminations or Results of Inflammation.—Dr. Bennett having shown that inflammation consists essentially in an exudation of the *liquor sanguinis* or blood-plasma (*i. e.* the fluid portion of the blood composed of fibrin dissolved in serum), next adverts to the changes this exudation may be subjected to: *i. e.* the *terminations* of Inflammation.

"What have hitherto been considered as the terminations of inflammation, viz. adhesion, softening, induration, suppuration, granulation, ulceration, gangrene, &c. modern pathology has shown to be in themselves highly complicated processes. John Hunter was of opinion that these various results were explained by supposing the inflammation to undergo certain modifications, or that it terminated differently according to certain tendencies which it possessed; hence the terms adhesive, suppurative, ulcerative, and gangrenous inflammation. According to the view, however, which we have endeavoured to establish, viz. that inflammation essentially consists in an increased exudation of blood-plasma, it follows that this process in every tissue and under all circumstances is the same. The exudation having once taken place, any further changes we may observe in it will depend upon the amount or rapidity with which it is poured out, the tissue in which it occurs, its chemical and vital proportions, and the accidental circumstances which modify or destroy growth both in the vegetable and animal world. Whenever the exudation of blood-plasma poured out coagulates, it can only be removed from or assimilated to the economy by one of two results, viz by death, or by passing into organization. When it does not coagulate, which is an occurrence of great rarity, it may again pass into the vessels by endosmosis, and in this way the parts return to a normal state. Resolution, however, as at present understood, is a very compound process It is used to express the disappearance of the inflammation without its producing any external lession. In this manner it may follow hæmorrhage, softening, or suppuration, and great difficulties impede our attempts to ascertain with exactitude how, under these circumstances, the exuded and organized blood-plasma is absorbed For this reason, therefore, we shall discuss this portion of our subject in the following order:—1, the Termination of Inflammation in Death of the Part. 2. In Organization. 3. In Resolution." 44.

We regret that our space will not allow us to follow the author into the

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details of this subject: we may, however, present a brief sketch of the conclusions he arrives at, for the purpose of exhibiting his application of the doctrine of Cytogenesis to the explication of the various phenomena resulting from inflammation. The nature of the cellular theory of Nutrition, which has accomplished so much in simplifying and generalizing our knowledge of the intimate structure of animated beings, has already been explained in this Journal.* As the solid, coloured, corpuscules of the blood are subservient to the maintenance of the animal heat of the system, so is the fluid portion, the *liquor sanguinis*, the essential element of nutrition, the *plasma* destined to supply the material of every variety of structure. In this "*nucleated cells* are formed, which are again ultimately developed into the different textures, or made subservient to the function of secretion." When the exudation of this blood-plasma takes place in a defective degree, we have *atrophy* induced; but when, on the contrary, from the distended and attenuated state of the capilliaries, it exudes in excessive quantity, *inflammation* is said to be present: and the nature of the termination of the inflammation depends upon the changes which are wrought in this excessive exudation. Why these should differ in different cases is not always explicable, any more than why, from the same plasma in its normal condition, so great varieties of ultimate structure are evolved. The termination of inflammation in the *death of the part*, is termed *mortification* or moist gangrene when acute, and *ulceration* when chronic. Of the former Dr. Bennett observes:

> "Occasionally a very large amount of blood-plasma is thrown out, constituting a violent inflammation: a greater or less number of capillaries are also ruptured and blood corpuscules are more or less mixed up with the *liquor sanguinis* exuded. The exudation thus formed compresses the part so as to obstruct the blood-vessels, and prevent the continuance of any circulation in it. Under these circumstances, instead of forming a blastema for the production of new organisms, it undergoes chemical changes which induce in it decomposition, and the part is said to be mortified."

Mortification arises from various other circumstances besides inflammation, as the effect of different chemical or mechanical injuries in directly destroying the tissues, or the leading vessels supplying the part, the obstruction of the arteries in the aged, &c. Examples of mortification from inflammation are seen after burns, exposure to frost, some forms of erysipelas, &c.—the excessive amount of exudation from all these causes obstructing the circulation.

In *ulceration* there is less exudation thrown out than in gangrene, which neither undergoes decomposition nor organization, but acting as a foreign body upon the circulation of the surrounding parts, thus causes their death. Examined by the microscope it is found to contain numerous minute granules, mingled with some imperfectly formed cells. It, and the structures compressed, eventually become broken-down into a semi-fluid mass, which obtains exit at the surface.

Termination of Inflammation in Organization.—Organization consists

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* See Med.-Chir. Review, Vol. 40, p. 1; Vol. 41, p. 124.

in the formation and development of nucleated cells, and, in the great majority of cases, the blood-plasma exuded in inflammation forms a *blastema* or germen for their production. Under different circumstances, however, various degrees of such development occurs; and the author enumerates four varieties of modes in which organization may be effected, in each of which the microscopic characters of the cellular resulting production differ. 1. From the exudation may be formed certain *plastic* corpuscules and primitive filaments, constituting *lymph*, as seen on the surface of the serous membranes. 2. It may be transformed into what the author terms *exudation granules, masses and cells*, forming the inflammatory *softening* of parenchymatous organs. 3. It may be transformed into corpuscules (pus) constituting *suppuration*. Purulent matter does not therefore, as supposed by Hunter and his followers, result from an altered action of the vessels, secreting it from the blood: but is a fluid having its own distinct nucleated corpuscules floating in the *liquor puris*, and results from changes which have been operated in the exuded plasma.

"Before quitting this subject it is necessary to observe that the three varieties of corpuscules we have described frequently undergo important modifications. What has been said refers to what may be called the type of such formations. In individuals who labour under particular cachexies, as scrofula, syphilis, scurvy, &c., the corpuscules vary more or less in their characteristic properties. We believe, however, that the separation of the three kinds of corpuscules, which distinguish the three great products of inflammation, will facilitate the future study of the differences which these structures occasionally present. This the more so, as, according to our observations, it is rare, that the additions of reagents will not enable us to refer them to one or the other of these divisions."

4. *The exudation may be transformed into permanent tissues.*—The regeneration of lost parts is accomplished or some substance is produced in lieu of them. Complicated tissues are seldom regenerated, as the skin, lungs, brain, &c.; but simple tissues are, as the filamentous, fibrous, and even the osseous. Of all reproductions the fibrous is most frequent. This new production of tissues from the plasma is accomplished by the formation of nucleated cells, exactly as is observed in the organization of the various tissues of the embryo. As an example of what occurs in other parts, *mutatis mutandis*, we may select the description of the processes by which wounds are united.

"After a time, which varies according as the blood more or less abounds in fibrin, the cut surface is glazed, as it is called, that is, the exudation has coagulated on the surface and is transformed into plastic lymph. If now the parts are accurately brought together, little more exudation takes place. Cells are formed, which rapidly pass into a fibrous formation, and healing, or *union by the first intention* is the result. When, however, the lips of the wound remain apart, or there has been loss of substance, the exudation is more copious externally than internally. The portion which is infiltrated into the tissue surrounding the sore, constituting the inflamed, red, and indurated margin, is transformed into exudation-cells, which, on breaking up, are absorbed. Some of these occasionally find their way to the surface, and become mixed with pus-corpuscules,—a circumstance which probably, with some, has supported the supposition that these structures are different stages of one growth. On the other hand, the exudation which is poured out externally on the surface of the sore is very abundant, and

is transformed partly into the pus cells, and partly into primary cells, which are by the process of development, converted into fibres, and ultimately constitute the cicatrix. The portions of exudation which are undergoing this process are called *granulations*. As these become more numerous, the amount of pus diminishes, and a greater tendency is manifested in the exudation to pass into permanent tissue. At length, pus ceases to be produced,—the whole exudation passes into fibres, a new surface is formed,—the which, contracting, after a time, constitutes a cicatrix." 62.

Why from the same plasma exuded into the inflamed tissues these particular transformations are produced is not easy to explain; but there are certain circumstances which exert considerable influence in determining the particular kind of change, and of these Dr. Bennett mentions three. 1. The nature of the surrounding elementary structure. Thus, exudation in the neighbourhood of cellular tissue is developed into cellular tissue, and that near bone into bone; while every tissue is liable to hypertrophy, during chronic exudation. 2. The degree of vital power of the organism exerts much influence. Hence the imperfect organization of the exudation when the vital powers are low, or the constitution of the blood is changed. 3. Great influence is also exerted by the rapidity with which the exudation has taken place. If the inflammation has been acute, and the exudation large, one of the three forms of corpuscules, the exudation, plastic, or pus, is readily produced; but if it be chronic, and the exudation comparatively sparing, the higher degree of development of the cells into fibrous or other tissues, or the hypertrophy of various organs, results.

The Termination of Inflammation by Resolution—Resolution or absorption of the exudation may follow any of its transformations, with the exception of that which has converted it into permanent tissue. "The early phenomena first disappear; the capillaries recover their contractility; the attraction between the blood and the parenchyma ceases; and the blood within the vessels begins to oscillate, and at length flows in a continuous stream." Occasionally, but rarely, the plasma remains uncoagulated for some time after its exudation; and then, at the restoration of the natural condition of the vessels, may re-enter them by endosmosis unchanged. Once coagulated, it cannot be absorbed, unless again rendered fluid. The nucleated cells are broken up, and the transformed exudation reduced to a soft, pultaceous, diffluent substance.

"The disintegration of pus-corpuscules previous to absorption is evidently favoured by the pressure which the abscess receives from the contraction of the filamentous and elastic tissues that form its walls. This is shown by the increased hardness which always accompanies the disappearance of suppuration by resolution, and the good effects which result from direct pressure employed by the surgeon to discuss these swellings. In Berlin, the most successful treatment for bubo consists in simply placing a stone of one or two pounds' weight over the tumour in the groin, as the individual is lying on the back. It is probable, also, by increasing the contraction of the integuments, as well as by removing fluid from the neighbourhood of the part, that irritants, blisters, and cauteries, are beneficial in the resolution of abscesses."

The molecular fibrin which re-enters the circulation after the breaking up of the exudation, is for the most part eliminated by the kidneys.

Schönlein, Zimmerman, and other German physicians, have especially called attention to the turbid and highly coagulable condition of this fluid during the resolution of inflammatory diseases.*

Mr. Travers takes a very different view to Dr. Bennett of the various results or processes of inflammation; and describes these under the separate heads of adhesive, suppurative, ulcerative, and gangrenous observations. As illustrative of the nature of the healing process, he gives a complete description of Dr. Todd's dry preparations, now in the Museum of the College of Surgeons: but, as these, owing to the absence of any accompanying memoranda, left the subject very incomplete, he was induced, with the aid of Mr. Quekett, to repeat the various experiments upon the web of the foot of the frog, allowing the animals to live, and witnessing, and recording from day to day, the various stages of the healing process. These records will prove very valuable aids to future observers, as their accuracy can be relied upon. We can only allude to the general summary of results, advising all those who feel interested in the subject to consult the detail of the various phenomena.

The first result of local irritation is *stasis*, or arrest of circulation, proportionate in extent and duration to the amount of injury done. The circulation is oscillatory at the verge of the stasis, beyond this preternaturally slow, and yet farther off, rather quickened. 2. Effusion of serum or of *liquor sanguinis*, the latter denoting the severer degree of irritation. 3. Fibrin of the liquor sanguinis is only capable of organization when separated from other constituents of the blood, as the coloured globules, &c. 4. In the act of coagulating upon the face and sides of the wound, the fibrin separates from the serous portion of the liquor sanguinis, and becomes a membranous crust, covering in the wound at all points, the sections of vessels, &c., forming the intermedium for vascular anastomosis in union by adhesion. 5. The separation of the lymph particle from the blood within the vessel at the margin for supplying the permanent plasma. "The first deposit effused with the liquor sanguinis is an amorphous exudation, and presents no such regular figure and arrangement as the lymph particle which has been separated within the vessel before deposit." The first serves as a mere temporary bond of union, and nidus for vessels, and is then absorbed; the second is a substantial addition of structure. 6. The oscillation attending the recovery of the circulation is the first movement towards the formation of a new circulation. 7. A blood-corpuscule escapes at several points of the margin of junction between the original circulation and the new plasma. Its track is rapidly followed by a file of single corpuscules. After a while, motion, at first oscillatory, and afterwards progressive, is imparted; a distinct appearance of vessels is conferred, and numerous anastomoses occur, until the free margin of the lymph more and more encroached upon is at last crossed and covered. Isolated or independent centres of vascularization, unconnected with the original capillaries, do not exist, although appear-

* See Med.-Chir. Rev. Vol. 41, p. 150, for an account of Zimmerman's researches upon this subject.

ances sometimes resemble these: the fabricator of the new vessel is the blood-corpuscule derived from the adjacent capillary.

"The temporary stasis seems to be necessary to the exudation of the liquor sanguinis, its continuance to that of the separated lymph particle; and not less the graduated impulse of the returning circulation to the elimination of the blood-corpuscule in single globules for the fabrication of new vessels: for if it were in mass (hæmorrhage) it would destroy instead of promoting organization.

"All capillaries, then, may convey either pure serum, or the liquor sanguinis, or the blood-corpuscules, severally and distinctly; secretion or separation being, like all the processes of inflammation, a positive action subject to vital laws, not an accidental outpouring, like that from a ruptured vessel.

"I greatly doubt if the separation of the lymph particle within the vessel is ever a normal state, *i. e.* unpreceded by stasis, although breach of texture is not necessary to its appearance; an exudation of organizable lymph continually happens without primary breach. The intrusion of the blood-corpuscule into the serous capillary is only under the nisus which leads to congestion, or that of inflammatory action. When the last is established, colourless vessels come into view, becoming at first tinted, and then deeply coloured. The lymph is laid down as the arterial capillary circulation resumes, and always of necessity precedes the generation of new vessels; which process does not commence until after the original circulation, to the extent that it is uninjured, is fully restored, as an energy beyond that which exists in the normal state is required." 170.

To the question whether *effused blood is instrumental in effecting adhesion*, Mr Travers thus replies.

"Is the blood, when effused from wounded surfaces, a medium of organized adhesion? or capable of becoming so? I answer in the negative; the question turns upon a delusion. If the wound be so small as that the effusion of blood is restrained by the adaptation of its sides, whether naturally falling together, or artificially compressed, the separation of its colouring matter is shown by a plentiful oozing of sanies at its mouth, and the formation of a crust. If, on the other hand, the wound be of such form or size as to prevent coaptation, or be attended with loss of substance, the coagulum of coloured blood being in proportion, acts as a foreign body, and must be dislodged prior to healing. Hence the difference in the time, and often in the mode, of healing of a small gaping wound left to itself, or a wound with loss of substance, and that of a larger wound, whose sides are immediately brought and maintained in contact. Thus the agglutination of the lips of a small wound by a thin layer of blood, a merely temporary expedient, is no bar to the union, but the contrary, both in respect of hæmorrhage and union, though never forming the permanent bond. In truth, no wound of any dimensions, however favourably situated for the adhesive process and rapidly united, has not, when fresh, a layer or pellicle of blood coating its surface; not admitting of removal by abstersion, but insusceptible also of healthy organization. The separation and deposit of fibrin takes place distinctly and after an interval. This is marked even in cases of simple division of the solid, but in loss of substance occupies many days: being step by step, and only just ahead or in advance of vascularization. No preparation so exactly illustrates the temporary use, and the permanent non-effectiveness, of the clot of blood; and, on the other hand, the distinctness of organizable fibrin destitute of colour and available for union, as the wound of an artery by a round ligature. The ultimate complete absorption of the clot is equally well exemplified." 82.

Of Suppurative Inflammation Granulations, and Pus.—Mr. Travers regards pus as a secretion, the lymph being organized into granulations for its production, where loss of substance has to be provided for.

"This consists in the formation of granulations or small eminences, into which the lymph pellicle, common to all wounds, is elevated, so organized as to constitute a temporary or occasional apparatus for the secretion of pus. The granulation is a mesh of the terminal loops of capillary pencils, formed, as has been described, under the adhesive inflammation, in the newly deposited fibrinous membrane coating the surface of the breach or cavity in the original solid.

* * * * * * *

"The aspect of the suppurating membrane also varies to such extent as scarcely to exhibit, in some circumstances and situations, the granular form; *e. g.* upon the walls of abscesses, and upon the free surfaces of mucous and serous membranes: but the fibrinous bed and the capillary loop of new formation, and a corresponding alteration of the pus-secreting surface from its normal state, will always be detected upon careful examination, being essential elements of the suppurative process. The product of granulations is a yellow, unctuous, inodorous fluid of a cream consistence, which is necessary to their function, and not less to their existence, until the purpose of their formation, viz. their coalition and levelling is accomplished by the free anastomosis of their proper vessels; and the new substance, be it skin, muscle, membrane, or bone, is perfected. The granulation is hollow or cellular when first produced, and the secretion of pus within it is progressively substituted by the secretion of the material required, which gives it the permanent figure of the new solid; the pus always diminishing in proportion as organization proceeds, until the secretion of pus ceases altogether, and the granulation properly so-called disappears." 111.

In another part of his work the author thus states his theory of the formation of pus.

"Pus, I believe, to obtain its characters of consistency, opacity, and colour, after exudation, and to consist of the superfluous or waste lymph which has been separated during the adhesive stage from the mass of the blood, held in solution by the serum, being thus a chemical modification of the constituents of the liquor sanguinis: in short, the latter fluid deprived of its original characters and property of spontaneous coagulation. Pus particles resemble those of lymph seen in the vessels under inflammation, except that they appear broken down and partly dissolved in their texture instead of compact, and of less regular figure; and if, when suspended in a drop of fluid, compared with the elastic blood-corpuscule, to which they bear no analogy whatever, utterly inert and devitalized. We never see pus in the blood-vessels but in fatal phlebitis, and if introduced into the circulation by injection, it is destructive to life. Although, therefore, a clean-wiped granulating surface soon presents a covering of pus, it is exuded as a colourless fluid, of a more dense and unctuous consistence than serum. Its appearance is simultaneous with the disappearance of the lymph particle from the veins. The suppurative action being determined, or in other words, the separation of the proper lymph particle put an end to by its sufficient deposit in granulation, and the inflammatory nisus still prevailing from the continuance of the irritation—for no imperfect state can be perpetuated—the superabundant lymph particle at no time coloured, along with the permanent fluid or serum of the blood, is strained off through the pencils forming the terminal loops of the granulation. Thus is obtained the two-fold purpose of relief to the loaded capillary circulation, and a bland and homogeneous protecting fluid for the granulation, during the period of its growth up to that of final organization. When the rudimental fibrin is no longer needed for the new structure, it is used, as in nature all remnants are, for a new but not less important purpose, the preservation of that structure. Pus is as necessary to the maintenance of granulation as lymph was to its formation. But a change is necessary to fit it for its new function, and this is provided for by a new arrangement or a new action of the secreting capillaries, and a chemical change, which destroys its vital property

and amalgamates the separated lymph-globules with the serum of the blood. The precedence of adhesive to suppurative action is sufficient to render presumable a necessary connexion between the lymph separated during the first process, and afterwards disappearing, and to explain the invariableness of this relation in the order of their appearance. There is no analogy between the effusions of serum or of liquor sanguinis incidental to primary wound or injury of any kind, and pus, yet the ingredients of the two latter are the same: it is by the combinations of a vital chemistry that their appearance and sensible properties differ, and this we are incapable of imitating.

"If this theory be admitted, it will explain the appearance of pus in the absence of the especial granular structure or distinct pyogenic membrane, as seen upon mucous, serous, and synovial surfaces and canals; and even in the absence of fibrinous exudations, as in certain modes of inflammation, where the habits of the parts or the character of the inflammation render them incapable of carrying on the adhesive action, or that action is by violence interrupted." 174.

The several stages of the action of a blister, according to the existence of a slight or large amount of irritation, present an illustration of the different inflammatory processes. Thus, there may be the mere aqueous effusion under the epidermis; the jelly blister abounding in albumen and fibrin, and slow of healing; the production of pus; ulceration; and even gangrene.

Pus, then, is *always an inflammatory product;* and where collections are found unaccompanied by marks of present inflammation, there are still always sufficient vestiges, in altered structure, to demonstrate that it has existed, and that in the *adhesive* form.

"The suppuration in diffused cellular inflammation, in cold abscesses after typhus, and other cases of constitutional exhaustion, as especially erysipelas and animal poisons, are the cases which appear to authorize the belief that pus may be formed independent of adhesive inflammation But it is my belief that, in these cases, the effused fibrin dies before its organization is accomplished, as granulations perish in certain ulcers. The vitality of the blood is so low as to render it unfit in quality for organization, or the circulation is so feeble as to be incapable of organizing the deposit; and thus the adhesive process is either imperfectly performed, or, is destroyed by the counteraction of ulceration, or by gangrene. The case is equivalent to that of ulcer in which granulation is wanting and cannot be produced, or if produced, maintained, owing to the preponderance of the absorbent over the depositing action, or the failure of all action. And in confirmation of this opinion are the sweeping extent and devastation of these abscesses, the bad quality and early decomposition of the pus they secrete, the frequent escape and mixture with it of blood and of gas, and the enormous sloughs of cellular membrane and fibrinous deposits by which they are accompanied. It is therefore no pathological exception, unless indeed an exception establishing the rule, since the same order of actions is preserved, but the constructive are cut short or overpowered by the destructive, from the diseased state of the blood and of the general habit. * * * * * * * * The phenomenon of late years brought under the notice of pathologists, of what are called *secondary deposits*, and of which I have seen many examples, require only to be referred to here. So far as the question, whether inflammation be indispensable to the production of pus, bears upon such cases, I consider them to form no exception to the universality of this law, and consequently repudiate the accounts of insulated deposits, unless in cases of admixture of pus with deposits of fibrin and coagula of blood, as in inflammation of veins, which I have seen both in the human subject and in animals, the subjects of experiment." 117, 119.

Depositions of lymph in various organs, when occurring in small quantities, may be easily mistaken for pus. "The theory of the consentaneous or consecutive occurrence of these deposits of lymph and abscesses, in parts remote from the seat of inflammation, is a distinct question, and to be so treated.

Ulcerative Inflammation.—In this chapter Mr. Travers replies to the various objections which have been offered to Hunter's theory of the agency of the absorbents in ulceration. He justly observes that, although no direct proof of such action were adduced, as applied to the products of inflammation, yet the agency of the absorbents being admitted as regards the removal of the *debris* of sound structure, the *onus probandi* of their not being so employed in broken structure rests with the objectors. Among the objections offered, the author notices the following:

1. *Ulcers spread most rapidly during inflammation, when absorption is diminished.*—Here the different stages of inflammation are confounded. In the early stage, when inflammatory fever is present, absorption is diminished; but it is augmented in the latter, when hectic is present. Ulceration cannot exist unpreceded by inflammation, and, when we wish to augment absorption, we first augment the activity of the capillaries by local irritation, or excite irritative fever by the administration of mercury.

2. *The tissues best supplied with absorbents do not ulcerate so readily as others inferiorly supplied. Thus bone, which is quickly absorbed before aneurism, does not ulcerate so readily as cartilage, which is very slowly absorbed.*—Here interstitial and ulcerative absorption have been confounded; the former being quite independent of inflammation, and many textures are prone to both forms, the mode and degree of irritation determining which shall prevail. Skin and mucous membrane of all textures, best supplied with absorbents, are also those most prone to ulceration.

3. *The state of congestion favourable to ulceration is adverse to absorption.*—It is so to healthy absorption, but, as it is a strong predisposer to inflammatory action, its establishment is consequently always looked upon as a probable forerunner of ulcerative absorption.

4. *Granulations ulcerate more rapidly than cicatrices, though they cannot be better supplied with absorbents.*—The granulation is in an unfinished stage, the cicatrix is a complete structure. The superior absorbing powers of the granulations may be judged of by the application of any minutely-divided substance.

5. *A part must become fluid before it can be taken up, and why should it not then pass off with the discharge?*—In open ulcers much must pass off in this way: but, what becomes of the discharge in extensive caries of the vertebræ, or where large collections of matter are disposed of? "I have seen cases in which pints of matter have been taken up from psoas abscess, and the parietes recover without breach."

"The rapid and extensive occasional action of the absorbents in cases of inflammation without breach, as the removal of the serum in local dropsies, the lymph in iritis, &c. is as incontestable a phenomenon as their continual action to regulate the adjustment of solid and fluid by removing useless and decayed parts in the healthy economy; and when inflammation is attended with breach, constituting ulcerative inflammation, they are the sole organs of the removal of parts,

and no animal structure is exempt from their operation. They do not take the initiative in inflammation, but act subserviently to prior changes. Ulceration, when it occurs, is consecutive to adhesion and suppuration, in almost all cases; and although suppuration may now and then pass without ulceration, in the same manner as adhesion prevents suppuration, yet the frequent case of ulcerative inflammation succeeding to abscess, and the very rare existence of ulceration without pus, constitute the ulcerative, third in order, of the processes of inflammation." 187.

The following are valuable practical observations:

"Although 'ulcer' is a comprehensive name for sores formed by the ulcerative inflammation, in many states and phases of their existence such sores exhibit no ulcerative action, as when that mode of inflammation is arrested. The interstitial absorption is the process by which what is called a healthy (healing) ulcer is dressed, levelled, and prepared for skinning, and it is only when this natural, not morbid, action, has superseded the ulcerative, that the healing process is fully established. No sore can heal while ulcerative absorption (the inflammatory process) continues either upon the edge or the centre. This mode of inflammation is so directly opposed to the adhesive, and so adverse to the healing, that being arrested, the hindrance to healing is removed. To put an end to it, therefore, is the surgical indication. This is done by constitutional and local treatment jointly; in some cases the one, and in some the other plan avails most.

"To know the character of ulcers and treat them accordingly, is a subject of the first importance to the practical surgeon, and well worthy of his science, though often not so regarded. They admit of a general classification, but present many varieties and anomalies. The great distinction is the presence or absence of the ulcerative inflammation, *i. e.* the morbid condition and action of the absorbents, by which the ulcer was formed. An inflamed is an ulcerative ulcer; so is an irritable, and more or less so is also an indolent or callous ulcer: in the gangrenous or sloughing ulcer, ulcerative inflammation is, as in gangrene, a necessary remedial agent for the purpose of separating the dead from the living parts, thus clearing the surface for sound granulations, and the edge for skinning. It is not necessary that ulceration should have existed prior to granulation, although granulation must succeed to ulceration; an ulcer has no other means of repair. The adhesive, then, is the curative termination of ulcerative inflammation; and, if for any reason the part is incapable of this action, disorganization and death is the consequence.

"It is, as we have shown, by ulcerative following suppurative inflammation, that matter and foreign bodies are brought to the surface and extricated, and that preternatural openings of communication, fistulæ, and sinuses are formed. But happily the adhesive action has gone before in the majority of such cases, and consequently, both external and internal openings and passages are defended by it, and the ulcerative process guided and circumscribed. Thus abscesses point, and effusions of the secreted fluids are prevented, and preternatural communications of the viscera with the surface are walled off and shut out from the system. If sudden injury or a cachectic state of the body anticipate this adhesion, and the ulceration is undefended, the worst consequences ensue." 198.

Cicatrization.—This is the finishing stage of the adhesive process, and the completion of the process of granulation. It is rapid in proportion as the diameter of the ulcer is small, the surface level, and the secretion of pus diminished. A reason of the difficulty with which a sinus heals is the abundant secretion of pus from its surface. Others are its limited contact with the skin, and the non-development of granulations, which appear, however as soon as the sinus is laid open. When an ulcer has formed

upon an old cicatrix, its healing is usually tedious, owing to the defective quantity of surrounding free cellular membrane for the formation of granulation, and to the imperfect condition of the circulation in secondary formations.

"It has been a question whether skin is formed from the margin of the vessels of the skin, or upon the surface, by the vessels of the granulation. This I have no difficulty in answering. Certainly by the surrounding skin; for, first, we see it gradually advancing from the margin, and equally reducing the diameter of the sore from day to day; secondly, we never see the skinning process without the described preparation of the border, and the process is quicker or slower in proportion to the distance of the skin from the centre; thirdly, the insular patches frequently observed upon the bed of an ulcer, especially unhealthy ones, may always be traced to a portion of undestroyed skin, thus confirming the fact. Lastly, the cicatrization beneath the surface, as of abscesses and fistulæ, is not, as before observed, by the formation of skin, or of proper granulation, but by an adhesive process, which tacks the skin to the subjacent cellular texture condensed by inflammation, drawing it inwards into folds and puckers: in short, a process similar to that which we see in the obliteration of cysts by pressure, and in the formation of solid tumours, to which the skin becomes adherent during their growth. *It is* very common to see these folds and indents of skin over scirrhous and other tumours, having so precisely the appearance of cicatrices after an abscess or an operation, that we are erroneously led to believe one or the other must have taken place.

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"The extraordinary rapidity with which an ulcer sometimes forms skin, compared with its usual rate, conveys, with other circumstances, the not incorrect impression of the vessels of the surface indirectly aiding its formation. This is resulting from the contraction of the vessels of the granulations, in their union and levelling, giving a glazed appearance to their surface as the secretion ceases, and the (quasi) pellicle begins to form. But the act of cicatrization consists not in any fresh deposit: it is simply the last stage or completion of vascularization which renders the transparent lymph surface nebulous or opaque, and this always commences from the margin whence the vessels are derived, and is progressive from the circumference to the centre. The actual form of membrane is never accomplished, such as could be separated by fair dissection at any stage, from a cicatrix; it is a permanently opaque, unsecreting surface, a condensation of the new lymph with the cellular texture beneath or surrounding it, serving the negative purpose of a semi-organized covering, viz. protection to the part. Like all other new structures, it is a copy, and differs, as all copies do, whether of nature or art, from the original." 207.

Our space will allow of our making but one or two extracts from the excellent chapter upon *Gangrenous Inflammation.* Mr. Travers, after describing the ordinary forms of acute and chronic or dry gangrene, proceeds thus:

"Gangrenous inflammation may be primary, *i. e.* no other mode of inflammation going before it. The circulation of the part and neighbourhood becomes stagnant, and the vessels, both arteries and veins, are choked with broken and semi-solid coagula. Is it due to the vehement intensity of the local inflammation and consequent exhaustion of the nervous life of the part? or to a constitutional condition, which renders the solid and fluid elements incapable of entertaining the functions of the part, on which depend its temperature and principle of resistance to external agents, in other words, its life? In all cases not produced by external injury, and in many that are so produced, I believe the latter is the true explanation. * * * * * *

* * Gangrenous inflammation, in the larger number of cases, is secondary to intense cutaneous and cellular inflammation, and so common is this association, that the term 'gangrenous erysipelas,' and carbuncular abscess are in practical use to denote these combinations, and the distinction of gangrenous from adhesive and suppurative inflammation. It is an acute inflammation directly disorganizing, because the resisting power of the parts affected by it is inadequate to sustain the circulation; this becomes stagnant and imperfectly coagulated in the larger vessels, for the blood loses the coagulating principle as it dies, while a non-vital transudation of their fluid contents loads the surrounding cells with sanies, with which pus is intermixed, where the suppurative process has preceded the gangrenous; and the whole texture perishes and putrefies. That it is a substantive mode of inflammation is shown by its occasionally idiopathic existence, as well as its distinctly-marked primary characters; by its supervention in decayed or diseased habits on very slight forms of injury; and especially by its tendency to spread along the neighbouring sound parts from the extremity towards the centre." 216.

The constitutional nature of the affection is thus stated—

"Gangrenous inflammation, therefore, is to be regarded as essentially of constitutional origin in all circumstances: its local termination is the same disorganization as follows from the work of destroying agents: in this extreme result only do the inflammation of gangrene, and the state of gangrene touch and analogize. When we speak of an inflammation passing into gangrene, we convey that the system is the medium through which such a change is expected and effected, and that thereby the whole character of the action is changed. For the process of sloughing (separation or disjunctive ulceration) to the extent necessary to clear a wound of spoiled textures, is a local process indispensable, and which excites no reasonable alarm, if the surrounding inflammation is of the adhesive kind, and the ulceration confined to the adhesive line, accompanied by a free suppuration.—These are indications of tranquillity of system and consequent power of the parts, whether the destruction is to the extent of a caustic issue, or involves the hand or foot. But if the spot of acute gangrene, idiopathic or from injury, be surrounded by the gangrenous inflammation, which spreads rapidly, and kills as it spreads, without provision for its arrest or its separation, we turn with well-founded alarm to the system of which it is a part, taking no comfort from the small extent or perfect reparableness, in other circumstances, of the mischief hitherto inflicted. We feel that so indicated, the failure of constitutional power is the fearful odds against which we have to contend, and this is corroborated by inquiry into the constitutional symptoms, and the pre-existing state of the patient's health and habits.

"To conclude, gangrenous inflammation, always originating in weakness, whether violence be combined with it or not, is never a process conservative of structure; and in this regard stands contrasted to all other inflammatory processes." 226.

We have perused both these books with much satisfaction and profit. The authors regard the same phenomena very differently; and each states his case very ably. In Mr. Travers' work the views of Hunter on inflammation are fully illustrated, and the various phenomena of the disease delineated with graphic powers of no ordinary description: while in that of Dr. Bennett, a difficult and obscure subject is lucidly treated, and an attempt made to apply to the explanation of anormal productions a theory which has so much contributed to the elucidation of the nature of healthy structure.

First Report of the Commissioners for inquiring into the State of large Towns and populous Districts. Vol. the First and Second. 1844.

[Second Article.]

A glance over Good's Nosology, where we survey the melancholy catalogue of ills to which flesh is heir, is enough to appal the stoutest heart; but a perusal of the miseries, malarias, and morbific agencies, laid open by the Sanatory Commissioners, may well "frighten the isle from its propriety," and drive into madness and despair the human philanthropist. But the philanthropist is not always the philosopher. From a wide survey of human nature, he learns the mournful fact, that misery and death form a part of the wise system ordained by Nature's God for the government of mankind—and even of the brute creation. Were there no diseases and causes of diseases to curtail the natural range of existence, how long would the earth we inhabit afford food for the inhabitants? *Even* as it is, the population, in spite of bad drains, malaria, crowding, &c., with "the varying intensity of their operations," rapidly increases, rendering each successive generation more straitened for room, more worn by competition, more stinted in food, clothing, and wages, than their predecessors! Still, the *rate* of redundancy is greatly checked by these sad evils, that seem the inevitable lot of humanity. Suppose, for example, that by some strange combination of circumstances, the manufacturers of this country were, all at once, enabled to increase the wages of their workmen three-fold—to raise them from ten to thirty shillings a week. What would be the consequence? Marriages would be infinitely more numerous, and more early contracted—children would multiply more quickly—parents and children would live longer, from the increase of their comforts, both in food, clothing, and lodging, and, finally, the rate of increase in population would be doubled or trebled. In a few years—certainly in [illegible] the redundancy would be such, that wages would [illegible] competition—and the miseries, privations [illegible] we are now bewailing and en[illegible] [illegible] accumulate to a similar or greater [illegible] ment! Thus, the philanthropist [illegible] aring away the *causes* of sickness [illegible] are constantly tending to increase [illegible] redundancy of population!

[illegible] the Christian halt in their humane ef[illegible] [illegible] in fact, irremediable. The *immediate* [illegible] around them and before their eyes—[illegible] at a distance—dimly seen—little co[illegible] [illegible] All the best feelings and impulses of [illegible] *palliate* miseries which we cannot [illegible] religion, morality, and hu[illegible] [illegible] the noble, though fruitless [illegible] from the crowded cellars [illegible] population!

In our last number we gave a general and comprehensive view of the Sanatory Report, and shall confine ourselves, in this article, to some particulars of a more local and specific character.

1. *Dr. Southwood Smith.*—The examination of this able and observant physician leads the van in these volumes. He states that the neglect of cleansing and drainage are the grand causes of sickness among the poor of the metropolis—especially in the "fever districts"—viz. "those localities where fever is *always* so prevalent as to be regarded as the ordinary seat of the disease."

"The fever districts of the metropolis are situated in different parts of it; and it is in accordance with ordinary experience to find fever raging in some of these districts, at the very time that others are enjoying a temporary immunity from it. In former years I have found, on my personal examination, some localities in which there was not a single house in which fever had not prevailed, and in some cases not a single room in a single house in which there had not been fever. I observed this particularly in certain localities in Bethnal-green and Whitechapel: now, during the present year, there has been a very remarkable absence of fever in these its ordinary seats, while in other districts it has been more than commonly prevalent." 2.

There is some discrepancy here. If a fever district *always* presents fever, how is it that one district will be free, and another scourged by the malady, at the same time—the bad drains and filth remaining the same? There must, therefore, be more than malaria engaged in the generation of fever, notwithstanding the "immediate neighbourhood of uncovered sewers, stagnant ditches and ponds, gutters always full of putrefying matter, nightman's yards, and privies the soil of which lies openly exposed, and is seldom or never removed."

It is not a little remarkable that Bethnal Green and Whitechapel should ever be free an hour from fever under such circumstances as above! But the essential cause of epidemic fever is just as little known as it was in the days of Hippocrates. That malaria, however, is a potent auxiliary to the invisible fiend, cannot be doubted, from the increased ratio of mortality in the malarious districts. It must be borne in mind, however, that wherever we find filth, crowding, and bad drainage, we also find poverty, with all its moral, physical, and mental miseries, ten thousand times more destructive to health than all the stinks that ever issued from the banks of Thames, Tiber, or Rhine.

Dr. Smith remarks, that the period of life most liable to fever, is that which intervenes between twenty and forty years—so that it (fever) may be considered as *the* disease of adolescence.

"Two consequences follow of the highest interest and importance. First, it is clear from these tables that the period of human existence during which fever can alone be said to be prevalent is from the age of twenty to forty; that is, the period of maturity, the most precious portion of the term of existence, that during which the individual is best fitted for all the duties and enjoyments of life, during which he is most capable of promoting the happiness of others, and of securing and appreciating his own. But of this period that portion which is incomparably the most subject to the ravages of this malady is the earliest portion. Now it must be borne in mind that the poorer classes usually marry and have families at earlier ages than the middle and higher, the great majority, at least of the women, being

married at twenty. Of course it is during the succeeding ten years that they have young families, often very numerous ones, to support; but we have just seen that this is precisely the ten years in which fever is so prevalent as to furnish, in this comparatively short space of time, nearly as many cases as all the other periods of life put together. It follows, not only that the heads of families are more subject to the ravages of fever than any other class of persons, but that these persons are peculiarly liable to be attacked precisely at that period of life when they have the greatest number of young children entirely dependent on their daily labour for support." 7.

The same physician is of opinion that "no one who lives long in or near a malarian district, is ever, for a single hour, free from some disease of the digestive organs." The mind, he considers to be enfeebled as well as the body, in these localities, which is evinced by the quiet and unresisting manner in which they succumb to the wretchedness of their lot. "Their dulness and apathy indicate an equal degree of mental as of physical paralysis." The following picture is deplorable.

"In the year 1836," says one of the medical officers of the West Derby Union, "I attended a family of thirteen—twelve of whom had typhus fever, *without a bed*, in the *cellar*, without straw or timber shavings—frequent substitutes. They lay on the floor, and so crowded that I could scarcely pass between them. In another house I attended fourteen patients: there were only two beds in the house. All the patients lay on the boards, and during their illness never had their clothes off. I met with many cases in similar conditions; yet amidst the greatest destitution and want of domestic comfort, *I have never heard, during the course of twelve years' practice, a complaint of inconvenient accommodation.*" 10.

The depressing effects of malaria on mind and body induce to the taking of stimulants and also of opium. Godfrey's Cordial is the chief article exhibited to children. Dr. S. remarks that the fever of the metropolis at present may be called "a new disease"—being totally different from that which he was accustomed to see for a long series of years. "It is as different in its symptoms, and requires as opposite remedies, as any two diseases in the catalogue of nosology." The cause of this change is totally unknown to Dr. Smith. The fact itself is not very encouraging to the theorist—nor, indeed, to the practitioner.

"Of the nature and extent of the change which has taken place in the present instance, I may, in some measure, enable the Commissioners to judge by this circumstance. Formerly there was scarcely a day in which it was not necessary to take blood from some of the patients in the hospital; the inflammatory nature of the disease was the obvious and prevailing one, and blood-letting was indispensable to stop the progress of active inflammation in some vital organ. Now no case presents itself with any indication of active inflammation, and blood-letting is practised in the hospital scarcely four or five times in the year. Formerly wine, brandy, ammonia, anything in the shape of stimulus, was found to aggravate the disease, and was never prescribed excepting in cases attended with unusual prostration, or in the last stage of the malady: now the prostration is from the first so urgent that there is no case which requires any treatment at all that does not stand in need of stimulants; and such remedies at present often save life, whereas before they would probably have destroyed it; and this arises from a total change in the character of the disease." 18.

Our author considers the immediate and direct cause of fever to be a poison generated during the decomposition of animal and vegetable mat-

ters. But what can cause such dissimilitude in the fevers of one year as compared with others? The old answer—epidemic constitution—in other words—*ignoramus*. But although we know not what this *tertium quid* is, we know, or think we know, what will cure, or prevent it—sewerage and ventilation.

2. *Mr. N. B. Bagshaw.*—As Dr. Smith's grand remedial and preventive measures were water and air, Mr. Bagshaw's favourite is—SOLAR LIGHT.

"During a practice of 30 years in a densely populated neighbourhood, my attention has been repeatedly drawn to the influence of light, not only as a most efficient means of preventing disease, but likewise as tending materially to render disease milder when it occurs, and more amenable to medical and other treatment. Dupuytren (I think) relates the case of a lady whose maladies had baffled the skill of several eminent practitioners. This lady resided in a dark room (into which the sun never shone), in one of the narrow streets of Paris. After a careful examination, Dupuytren was led to refer her complaints to the absence of light, and recommended her removal to a more cheerful situation. This change was followed by the most beneficial results; all her complaints vanished. Sir James Wylie has given a remarkable instance of the influence of light. He states that the cases of disease on the dark side of an extensive barrack at St. Petersburgh have been uniformly, for many years, in the proportion of three to one to those on the side exposed to strong light. The experiments of Dr. Edwards are conclusive. He has shown that if tadpoles are nourished with proper food, and exposed to the constantly renewed contact of water, (so that their beneficial respiration may be maintained,) but are entirely deprived of light, their growth continues, but their metamorphosis into the condition of air-breathing animals is arrested, and they remain in the form of large tadpoles. Dr. Edwards also observes that persons who live in caves and cellars, or in very dark and narrow streets, are apt to produce deformed children; and that men who work in mines are liable to disease and deformity beyond what the simple closeness of the air would be likely to produce." 41.

When young people are going to be married, Mr. Ward advises them to choose the largest room they can find, and where the solar light is most freely admitted. Mr. W. thinks that measles are productive of great mortality—and that if plants were grown in the houses of the poor it would be "laying the axe to the root of the tree."

"That you would do more good to the poor by the adoption of some such plan than can be conceived; that by the introduction of those plants, you would induce the poor to get out into the woods round London, instead of going to the public houses." 44.

3. *Dr. Neil Arnott.*—Dr. A. agrees almost entirely with Mr. Smith.

"Our inquiries gave us the conviction that the immediate and chief cause of many of the diseases which impair the bodily and mental health of the people, and bring a considerable portion prematurely to the grave, is the poison of *atmospheric impurity* arising from the accumulation in and around their dwellings of the decomposing remnants of the substances used for food and in their arts, and of the impurities given out from their own bodies. The means of removing these sources of injury are—1st, the labour of scavengers for bulky solid matters; 2dly the use of sewers or drains, with a sufficient supply of water for liquids and comminuted solids which running water can carry; and 3dly, modes of ventilation for aerial matters." 50.

4. *Mr. Toynbee* states that, among the poor of the St. George and St. James's Dispensary, nearly all the families have but one room each. He was attending a family where the father, mother, a grown up son in consumption, a daughter of seventeen years, and a child, all slept in the same bed, in a room where the father and four other men worked as tailors during the day! The windows of the poor seldom open at the top, and when opened from below, an inconvenient rush of air takes place, and often does mischief. This prevents proper ventilation of rooms, and the want of ventilation he considers as the main cause of scrofula, which abounds in the district above alluded to. Tailors and other sedentary classes of the poor are very subject to scrofula, and also to gouty affections—the first direct, the second as sequences.

5. *Dr. Guy*—is one of the physicians to the King's College Hospital. Dr. Guy has directed much attention to the diseases of the poor—especially as affected by different avocations and professions.

"1st. Consumption is relatively more frequent in persons working in-doors than in those employed out of doors.

"2d. In those employed within doors, it is most frequent in men using little exertion.

"3d. It makes its attack earlier where it is of most frequent occurrence.

"4th. It is very common in the intemperate, and in those exposed to the inhalation of dust.

"5th. It is more frequent in men than women, at least in the metropolis." 89.

The proportion of consumptive cases, in gentlemen, tradesmen, and artisans, were about 16, 28, and 30 per cent. Thus the tradesmen of the metropolis are nearly twice as liable to phthisis as the gentry. This Dr. G. attributes to the confinement of the tradesman in ill-ventilated shops. We are much inclined to attribute it also to the frequent currents of cold air rushing into close and ill-ventilated apartments.

"In the course of your inquiries have you given any attention to the influence of habits of intemperance on health?——Yes. I have made an exact comparison between the classes most exposed to the temptation of drinking, and those who are not more intemperate than the greater part of the labouring class. I have compared, for instance, the drayman with the labourer, the pot-boy with the footman, and the licensed victualler with other tradesmen. All these comparisons are very unfavourable to the classes most exposed to the temptation of drinking. I find that, before 35 years of age, more than twice as many draymen die as labourers; and that, before the same period, the deaths among pot-boys exceed those of footmen by more than a third.

"You state that men who work out of doors are more addicted to drinking than those who are employed within doors. How do you account for this?——There are many reasons for it. The man who has much exertion in the open air is not so conscious of the effects of spirituous liquors as the man who leads a sedentary life within doors, nor does his occupation require so much thought or so steady a hand as that of the artisan. Those who work hard, too, think that some kind of fermented liquor is absolutely necessary. Moreover, many labouring men are hired at public-houses, and must recommend themselves by spending their money freely in beer and spirits. The brewers' draymen, the pot-boys, and the porters at wine-vaults, all have access to intoxicating liquors at all times, and are allowed a large quantity of liquor.

"Does your experience of the poor lead you to believe that habits of intem-

perance are on the decrease among them?——Decidedly so. I have taken much pains to ascertain the point, and have no doubt that they are fast improving in this respect, the younger more than the older." 99.

6. *Mr. Liddle.*—This gentleman draws a sad picture of the "WHITE-CHAPEL UNION," to which he is medical officer. The over-crowding of the poor has been much increased by the new improvements that are going on in that neighbourhood. "Some of the larger houses are now converted into lodging-houses which, for the most part, are shamefully crowded."

7. *Dr. Aldis.*—This gentleman is physician to several dispensaries—London Dispensary—Farringdon ditto—Surrey ditto, &c. He finds, generally, one badly-conditioned room occupied by a whole family, badly ventilated and filthy.

"The greatest over-crowding is displayed in Field-lane and its neighbourhood, in the courts leading out of Smithfield, in the courts leading out of Fetter-lane, and the courts and buildings leading out of Fleet-street.

"Some of the worst features of overcrowding are displayed on the Surrey side of the river, in the neighbourhood of the Mint, otherwise the characteristics are common. Within the rooms close offensive smells, the atmosphere quite vitiated, the fæcal smell of the cesspool is often distinguished; the courts are uncleansed and in a dirty condition. Some of the streets in Spitalfields are remarkable for their filth. The most over-crowding in the district of the London Dispensary is detected in the neighbourhood of Artillery-passage, Bell-lane, and Petticoat-lane." 112.

The drains, sewers, and water-supply are in a very neglected condition, and the stench, especially in summer, most intolerable.

"There is generally a filthy accumulation on the surface of the water in the water-butts. In some courts there is no supply of water; such is the case in Ireland-court and Lusigneas buildings, Red Lion-street, Spitalfields, which I visited to-day. One woman informed me that her husband lay dead, and that she could not obtain water without the greatest difficulty to wash his 'rags.' I went into her room and found her husband lying dead in a coffin; the room was small, dark, and dirty, and occupied by six children, in addition to the father and mother. Another female represented the place to be 'stinking alive' for the want of water. In the neighbourhood of Field-lane some persons have not even cesspools or privies; all their excrements are thrown into a little back yard, where they are allowed to accumulate for months together; others have a cesspool, but it is not provided with a drain, so that the excrements run into courts or streets, where they remain until a shower of rain washes them into the gutter. These are the places we are called upon most frequently to visit." 113.

The most prevalent diseases were fevers, inflammations, intestinal disorders.

"What is the ordinary physical condition of the population brought up under the physical condition you describe?——They are emaciated, pale, and thin, and in a low condition, the cases of asthenia being of common occurrence. They complain of sinking, depression of the strength, of spirits, loss of appetite, accompanied by pains in different parts of the body, with disturbed sleep. This feebleness of constitution, among other causes that come before us, may be ascribed to the unwholesome habitations in which they reside. We find, indeed, within our experience, considerable differences in respect to this depressed condition. I usually warn pupils that they must not bleed freely in the depressed

districts. Bleeding, which may be resorted to freely in rural districts, or in comparatively healthy suburban town districts, cannot be resorted to safely to the same extent in the more crowded and depressed districts. I find, whatever may be their condition as to employment, that more stimulants are requisite in proportion to the depressing influence of the impure atmosphere in which they reside. In all cases of disease, the removal to a purer atmosphere, or from their close rooms to the more spacious and better ventilated wards of the hospital, gives early relief. The depressed and low condition of health in which these people are always found, induces habits of intemperance unfortunately so common among them." 115.

8. *Dr. Rigby*—is senior physician to the Lying-in Hospital, Lambeth. Dr. Rigby has had ample opportunities of witnessing the effects of atmospheric impurities on females pregnant, and on children. The hospital in question, has seldom been free from puerperal fever that often produces frightful ravages that cause the building to be closed occasionally. Although every possible means were employed to ventilate and purify the wards at these times, the fever generally returned when the hospital was re-opened. It was now found that there were 1500 feet of open ditches near the hospital receiving the drainage of the poor and dense population of the neighbourhood, and presenting immense exhalations of mephitic gas. This evil was partially relieved at a great expense. The main drain of the building itself was found to be blocked up. All being ultimately cleared away, the fever disappeared.

"In your practice as a physician, have you had occasion to notice in private houses defects such as you experienced and struggled with at the hospital?—I have every reason to believe that in a large majority of cases the ventilation of private houses is very inferior to that of our large hospitals, more particularly as regards the effluvia from drains, &c. The arrangements also for ventilating the sleeping-rooms, especially the servants' bed-rooms, are very defective; the peculiar close, disagreeable smell of these latter chambers must be familiar to all.

"These defects, then, are not confined to the houses of the poor, but exist also in those of the wealthy?——They do; and in houses which have been built many years, to a great extent.

"Can you give some instances?——I may mention one family, the members of which were constantly exposed to the effluvia and stench arising from bad drains; they never had a cook remain with them long without suffering severely in health; as the state of the drains became worse, they all suffered, and at my urgent advice removed to a healthy suburb of London with the most marked effects in the improvement of health. These defects, as regard effluvia and stench arising from defective drainage, exist also among houses comparatively or quite new; for instance, in the Marylebone district, and even among some of the recently built houses of Hyde Park. In the former locality I am at this moment attending a lady in her confinement, whom I have with some difficulty rescued from an attack of puerperal fever, which threatened to assume the malignant form. On being summoned to her when in labour, I was struck by the offensive drain effluvia, which not only pervaded the lower parts of the house, but rose perceptibly from the area as I stood at the hall door, and I cannot help attributing this attack coming on, under all the favourable circumstances of wealth and station, to the deleterious influence to which I have just alluded." 121.

These are the chief results of the examinations of medical men in this over-grown metropolis, where one half of the inhabitants are unaware how the other half live or die! The large provincial towns and cities, as

Liverpool, Birmingham, &c., present the sources of disease in a proportional scale, and almost take away the hope of materially bettering the condition of the working classes, till labour is better paid, and the people become convinced of the imprudence of early marriages, and the dire effects of redundant population!

I. Traité de Pathologie Cerebrale. Par *Scipion Pinel.* Paris. 1844. 8vo. pp. 560.

A Treatise upon Cerebral Pathology. By *Scipio Pinel.*

II. First, Second, Third, Fourth, and Fifth Report of the Resident Physician of the County of Middlesex Pauper Lunatic Asylum at Hanwell, 1839-43.

III. Reports of Sir Alexander Morison, Visiting Physician of the Surrey Lunatic Asylum. 1842-43.

IV. General Report of the Royal Hospitals of Bridewell and Bethlem. 1844.

V. Report of the Metropolitan Commissioners in Lunacy to the Lord Chancellor. 1844.

In resuming the analysis of M. Pinel's new work, commenced in our last number, we have combined with it some consideration of the various "Reports," the titles of which are mentioned above, as tending to illustrate some of the subjects treated of in the latter part of the volume, Moreover, they are very important documents in themselves, as exhibiting not only what can be, and what has been done for the improved management of the insane, but also how much yet remains to do, before this can be considered as placed upon a satisfactory footing. It is understood that the Minister is about to introduce, during the ensuing session, some comprehensive measure for the provision, regulation, and inspection of the various classes of establishments for the reception of lunatics: and, judging from the report of the Metropolitan Commissioners, founded upon evidence derived from their recent visitation tour, not before it is needed. There are, it seems, 20,893 lunatics under confinement in England and Wales, of whom 16,821 are in the condition of paupers. Of this latter number 7,482 are alone provided for in receptacles especially devoted to the insane, the remaining 9,339, remaining in the workhouses, under, for the most part, every possible disadvantage. Even the magnificent establishment at Hanwell, and notwithstanding its dormitories are inconveniently crowded, is unable to supply the wants of the county in which it is situate; for while, in 1843, beds were made up for 1000 patients, the number of lunatics to be provided for amounted to 1429. Altogether there are 166 Lunatic Asylums in England and Wales, of which *seventeen only* are county asylums, 11 are supported in part by subscription, 1 is a military

and one a naval hospital, and 136 are private asylums, licensed by the provincial magistrates or the Commissioners of Lunacy, forty-four of these latter establishments receiving paupers as well as private patients. Add to all this, the very considerable number of persons who are residing in private apartments under the *surveillance* of a keeper, and submitted to no system of inspection whatever, and of whose numbers therefore no return can be made, and we observe that there is indeed an immense mass of helpless misery to be legislated for. The Report not only demonstrates the lack of accommodation which exists, but the urgent necessity of a more rigid system of inspection. Licensed Asylums, whose management the magistrates have pretended to superintend, have been found by the Commissioners, in many instances, to be most disgracefully conducted; the patients not only being surrounded by the most disgusting filth, but subjected to all the cruelties of the ultra-coercive system, and that at a period when we had fondly imagined the employment of the fetter, the leg-chain, the restraint-chair, and the lash was forever exploded. How slow is the progress of human improvement!

It will be recollected that M. Pinel arranges the affections of the brain into four classes, each distinguished by the derangement of some principal function of the organ. Thus there are *Lesions of the Understanding;* of the *External Senses and General Sensibility;* of the *Propensities and Instincts;* and of *Voluntary Motion.* The first we have already considered, and proceed to pass the others in brief review.

Chap. V.—Lesions or Perversions of the Instincts and Propensities.

The love of life is the strongest of the instincts implanted within our organization; and it is upon it, and upon all tending to encourage its development, that our laws and social institutions are based. But this instinct has its diseased manifestations, just as the understanding has its maladies. All the chimerical fears of hypochondriasm may be produced when its diseased condition is but slight, while, when the perversion becomes complete, we have suicide, a desire for self-destruction, just as imperious as is the instinct of self-preservation in a normal condition of the cerebral functions. Or, again, a desire to kill others becomes another symptom of the disease, a homicidal mania actuated by no motive whatever.

1. *Hypochondriasis.*—The author suggests that as this and similar affections are characterized by exaggerated fears concerning health and life, *biophobia* would be a more appropriate appellation; and we may thus speak of slight or severe biophobia instead of hypochondriasis, suicidal biophobia, homicidal biophobia, &c. Certainly a worse term than hypochondriasis can hardly be chosen. Of all the causes of this distressing disease, M. Pinel considers an hereditary predisposition as the most prominent, "for if we go back to a period prior to the invasion of the disease, we find these patients, or their relatives, have been capricious, choleric, dull, or merry, without apparent reason, very liable to a variety of nervous ail-

ments, and that there have been members of the family afflicted with insanity or epilepsy." He regards the disease as essentially an affection of the central portions of the brain, and that the serious accompanying affections of the thoracic and abdominal viscera are but the results of an aggravated degree of this cerebral lesion.

2. *Suicide.*—This species of suicide, resulting from a perversion of the instinct of self-preservation, is to be distinguished from suicide occurring in the insane, consequently upon illusions. Suicide is sometimes, as in the example of puerperal women, an acute affection, the desire of destruction continuing for some days, and then, if its fulfilment has been prevented by active surveillance, passing off and the patient becoming cured. At other times the act has been long premeditated, the instinctive love of life struggling against the effects of the lesion. The torment of an incurable disease, the long wished-for leisure after an active life, the state of mind resulting from an exhaustion and abuse of sensual pleasures, or from the operation of various physical and moral influences, may one and all lead to this imperious desire of self-destruction. Occasionally we see persons surrounded by every comfort and means of happiness, place their affairs in order, take leave of their friends, and destroy themselves—some unperceived circumstance having in them given rise to this perversion of the instinct. Mutual suicide, generally occurring in the case of persons of opposite sex, influenced by love or extreme distress, has become very prevalent in France, to which the injudicious publicity given to these events in the newspapers has doubtlessly contributed. No age seems exempt; for suicide is committed from the age of 12 to that of 80, and the wells at the Bicêtre have been closed in consequence of the increasing propensity among the aged persons for throwing themselves into them. The contagious effect of examples of suicide is indeed well known, and at some periods the affection has become epidemic.

The act of suicide is usually preceded for a considerable space of time by some of the various symptoms of hypochondriasis; but after a while the desire of death as a means of escape from real or imaginary misery becomes the dominant idea, and is dwelt upon with pleasure. But months or years of irresolution are sometimes passed in a constant struggle with this propensity, until the physical frame and mental power of resistance are worn out. In the acute form, no matter what the means of death, it is sought with avidity, and sometimes with incredible cunning; but, in the chronic form, some particular mode of destruction is determined upon, and none but it, as well as a certain time, place, &c. will suffice. Perhaps about one-half of those persons who attempt suicide, do not succeed; and the revulsion engendered by the panic they are then seized with, often operates as a, at least temporary, and sometimes permanent means of cure.

The author believes modern civilization to be a great encourager of suicide, by reason of the forbearance which it manifests towards those who attempt it, and the notoriety it obtains for them in the public prints. He contrasts with this the rigid laws of the Greeks, Romans, and St. Louis.

The disposition to suicide existing in many insane persons has always proved a source of much inquietude to their friends and attendants; and the adoption of the most rigid restraint was long considered as the only

safeguard. It will be seen that prevention by this means must be rarely practicable, for the very instruments of restraint have been often converted into means of destruction; and it is a most happy circumstance, that in proportion as coercion of this description has been disused, the proportionate number of cases of suicide has diminished, and the number of cures augmented. This is the concurrent testimony of all modern insane establishments. The Bethlem Report states:—

"The experience of the last year adds another confirmation to the now generally received opinion, that mechanical restraint is an exciting cause of suicidal propensities; and though it may for a time restrain the attempt, it fosters and strengthens the desire it is intended to control. During the last year, so large a number as 81 patients, or more than 28 per cent. of those admitted, were reported as having suicidal tendencies; and 37, or 13 per cent. had actually attempted suicide prior to admission; and it is highly creditable to the officers of the hospital, and an indisputable proof of the vigilance of the attendants, that no attempt at suicide has occurred during the year. The last case of suicide was that of a female in 1840: no case amongst the males has occurred since 1822. No stronger evidence can be given of the tendency of mechanical *restraint* to excite suicidal attempts than that supplied from the records of the hospital; from which it appears that during 20 years, from 1750 to 1770, when every patient was under restraint, the suicides were in the proportion of 1 in 202, whereas, during the last 20 years, the proportion has only been 1 in 963." 53.

Dr. Conolly's Second Report from Hanwell contains some valuable observations upon this head.

"Nine suicidal cases are among the admissions of the past year. It affords gratification to the physician to be enabled to state, that in all of these cases means have been found to soothe and comfort the minds of the patients, and, apparently, to reconcile them to life. Their restraints have in all cases been immediately removed, and in no case resorted to again. They have been watched, so long as it was deemed necessary, during the day, placed in rooms with other patients by night, and frequently visited. Every instrument of danger, or obvious means of self-destruction, has been kept out of their way; and no measure likely to restore cheerfulness has been omitted. This is the general plan resorted to. But in almost every case of this kind the bodily health is manifestly disordered; and when proper remedial means are applied, the propensity to suicide is weakened, or disappears. Redness of the tongue; disinclination for food; irritable bowels; feebleness and emaciation; cold hands and feet; are not uncommon symptoms. In other cases, a loaded tongue, obstinate constipation, and appearances of hepatic disorder, are observed. Both of these descriptions are chiefly applicable to patients between 40 and 50 years of age. When submitted to proper remedial treatment, they commonly improve, although very slowly; the health being usually, or at least often, impaired beyond the hopes of perfect restoration. It is impossible for attention to these patients to be too vigilant, but not at all impracticable to establish such systematic vigilance on the part of the officers and attendants as will afford security. To torment these unhappy patients with bodily restraints, would only fix the morbid determination more deeply in their minds. Disposition to suicide is not uncommon in women at a much earlier age, and is usually associated with some uterine irregularity, to which may be added moral causes of various kinds." 40.

3. *Homicide.*—This is a perversion of the affective faculties, which is often accompanied by a complete integrity of the intellectual powers. It frequently precedes suicide; and, where this is not the case, the homi-

cide often voluntarily delivers himself into the hands of the law. These cases of motiveless homicide are the most frequent, and to be distinguished from those in which the intellectual powers are perverted, and murder is perpetrated under some delusion. Esquirol, Gall, and other authors, cite abundant examples of each of these forms. This distinction, however demonstrable to the scientific inquirer, has been received with difficulty in courts of justice; and is obviously open in its practical working to abuses. Nevertheless, no fact is better established now than that this impulse to kill may exist independently of delusion, and yet uncontrollable by its unhappy subject, who has been often known to seek the assistance of others to save himself or them when he has found the paroxysm approaching. These persons, if properly watched, and separated from sources of irritation, may frequently become cured of these terrible propensities.

Dr. Pinel dwells upon the importance of an improved study of this disease in reference to legal medicine, and records some of the confused and contradictory conclusions the courts of law have arrived at, parallel instances of which could easily be supplied from this country also. Much practical difficulty attends the case.

> "It is certain that such monstrous actions must at first carry terror into the minds of the administrators of justice, who fear lest every criminal may shield himself under the impunity of these examples. For, often in homicidal mania, as in crime, there is premeditation, hesitation, a consciousness of murder. It is only from the conjunction of circumstances which have preceded, accompanied, and followed the act of homicide, that evidence and conviction of non-culpability, and of the true character of the mania, can be obtained. The physiology of the brain is as yet too recent. Too short a time has elapsed since it has taught us that the affective, like the intellectual faculties, are but the expression of its normal condition, and may become solely the subjects of perversion, just as certain functions of the understanding may—for this knowledge to have penetrated among the masses and become vulgar: but it will do so." 322.

4. As this perversion of the affective faculties may occur as a grave disease in one possessed of his reasoning powers, so may it complicate the condition of those in whom these too have become perverted. Thus it is by no means uncommon in the insane; and it has been observed that those who were, prior to their insanity, of a mild demeanour and good moral conduct, form the majority of the subjects.

5. *Incendiary Mania.*—Marc pointed out this example of the destructive instinct in 1823, and numerous cases corroborative of the propriety of referring it as the above to the perversion of the affective faculties. The affection is frequently propagated by imitation, and often rages almost epidemically. At the commencement of insanity many patients are seized with the desire of destroying by fire; while, in other cases, individuals, possessed of reason, but of limited capacity, take great delight in committing the act. The following observation was confirmed during our recent trials for incendiarism in many instances.

> "Individuals of a very limited capacity may be made the instruments of malefactors for the accomplishment of their guilty designs. It is for a trifling reward, a piece of bread, often as a mere joke, that these weak beings allow themselves to be persuaded. They may be termed thoughtless incendiaries. Others

however merely obey the impulse of false ideas, insane conceptions, of which we have a remarkable example in the case of Jonathan Martin, who fired York Minster."

6. *Manie de Caractère.*"—Manie raisonnante of Pinel, and Moral Insanity of Pritchard. The author thus characterizes the condition.

"I think we may term manie de caractère that slight perversion of the instincts and affections which renders the individual a scourge to all around him, and which is yet unattended with mental delusion. These are turbulent, unmanageable beings, choleric in disposition, committing various censurable acts, which they are always ready to justify by plausible reasons; and who become to their friends and family a continued source of inquietude and grief. They commit mischief for amusement, malice, or wickedness, and are incapable of application or labour. They break, disarrange, and destroy everything. . . . . . Individuals afflicted by this partial perversion of the disposition, commit out-of-the-way actions, and maintain the most singular and absurd conversation, well knowing all the while what they do and what they say. The understanding suffers no lesion: the patient is enabled to justify his proceedings with a surprising connection and lucidity of ideas and expressions. There is but an *instinctive* perversion—a general exaltation of the bad propensities, but rarely to the extent of insanity."

Such persons often have violent outbreaks of short duration directed against a variety of subjects; and they have usually sufficient control over their violence, so as to escape from some of its consequences. There seems an innate perversion of the propensities, but not to an extent to warrant seclusion. When this perversion of the affections complicates ordinary insanity, the lunatic becomes the most insupportable of beings, creating eternal confusion and quarrels among the other inmates and their attendants, which indeed seems the chief object of their lives.

7. The propensity to *thieve*, so frequently exhibited in persons whose circumstances place them above the necessity, and many other perversions, all belong to the same category.

CHAP. VI.—LESIONS OF VOLUNTARY MOTION.

These may exist in the condition of exaltation, of debility, and of intermittence. In the first, we have placed maniacal furor, tetanus, convulsions, and chorea; in the second, paralysis, delirium tremens, senile tremor; in the last, epilepsy and hysteria.

It is obvious we cannot pursue the author's examination of all these important diseases; and will content ourselves with an abstract of his opinions upon *general paralysis* or *paralytic cerebritis*, to which he attaches considerable importance on the score of their originality. The Bicêtre has afforded him ample opportunities of studying these cases, two wards being expressly devoted to their reception. He believes very different pathological conditions have been confounded under one vague term, and recognises six distinct forms of the affection, differing in anatomical character, progress, and symptoms.

The *first* and rarest of these has not hitherto been described, and is that

which is associated with acute inflammatory action in the periphery and central portions of the brain, and which resists all the resources of art. 2. In this we have the affection of the brain in a chronic condition, with consequent ramollissement, of the gray substance especially, the membranes and white portions of the brain being also affected. The atrophy which results is accompanied by a general sinking-in of the brain, leaving a space between its periphery and the skull-cap. M. Parchappe, after his numerous investigations, came to the conclusion, that general paralysis essentially arose from a ramollissement of the middle layer of the cortical substance of the cerebral hemispheres. 3. With all the symptoms of acute phlegmasia there is found after death a condition of hypertrophy of the white portion of the brain, its volume and density being both increased, and the augmentation proceeding from the base upwards, so that at last the convolutions become flattened by reason of pressure against the cranium. The gray substance becomes diminished, and no vascularity of the white exists. This change in structure, when chronic, has very frequently been observed by various authors in epilepsy. 4. This is exactly opposed to the last form, consisting as it does in atrophy of the white substance of the brain. The hemispheres are often reduced to one-third of their volume, leaving more than an inch interval between their surface and the interior of the cranium. In most cases there is phlegmasia of the gray substance; but, as in the case of hypertrophy, the white portion is that in which change in bulk is observed. There are often meningeal hæmorrhage and serous effusions present, arising probably from the obliterated condition of the vessels within the convolutions. 5. In this the paralysis is *intermittent*, returning only at intervals of six months or a year, and then again disappearing for the like, or a shorter period. 6. In this the disease is cured, either by influence of the treatment employed, or, much more probably, by reason of the favourable constitution of the patient. Such cures are rare indeed, but they are occasionally operated upon patients seemingly at the point of death.

These various forms are illustrated by means of twenty-four well-narrated cases; so that the chapter forms a valuable monograph upon the subject well worth consulting.

"We are now in a position to observe that in general paralysis, as in all the other diseases of the nervous system, the changes of structure are very variable, and that they present very different types, each having very opposite aspect and characters, although the prominent symptom in all is paralysis, first of the organ of speech, and afterwards of the sphincters and limbs. We may see that the identity of lesion is a chimera that we must renounce, and the identity of the seat of disease is hardly more tenable."

Dr. Pinel thus speaks afterwards concerning the *Seat* of the disease.

"We observe that it is especially the muscles of the tongue, larynx, œsophagus, and sphincters of the anus and bladder, which are first paralyzed; and that it is only some time after that, first the superior and then the inferior extremities become affected. We feel no doubt that the affection commences with a lesion of the olivary bodies, or some of the nervous bundles emerging from these, and afterwards propagates itself to the rest of the hemisphere; or if the affection originates in the periphery, it must involve some filaments which are in relation with the olivary body. One must believe, from their singular configuration, the kernel of gray substance forming their centre, and from their development in man alone, that the

olivary bodies, whose function is as yet problematical, must preside over some faculty peculiar to man—the articulation of laryngeal sounds. The nerves of the pharynx, larynx, and tongue spring from them, and it is the lesions of these organs which proclaim the advent of general paralysis The facial arises in the same point, and the trembling of the lips and cheeks is very remarkable among these paralytics. Bell regards the olivary bodies as destined for respiration because the pneumogastric obtains thence parts of its origin, and the lesion of this nerve explains the inertia of diaphragm, the slow respiration, languor, torpor of the heart, and paralysis of the sphincters. * * * * The changes in the olivary bodies are as well characterized as those of any other of the nervous centres; but their examination, perhaps from difficulty of appreciating these, is completely neglected in autopsies. Nevertheless, Guislain, Esquirol, and others, have remarked their induration in epilepsy. In general paralysis their appearance and volume are in exact accordance with those of the other portions of the brain. In atrophy hardly a vestige of gray centre is discernible, while in hypertrophy they are large an projecting. We doubt not that in the stammerers and dumb these parts would present well marked changes." 396.

CHAP. VII.—LESIONS OF THE EXTERNAL SENSES AND OF GENERAL SENSIBILITY.

These, as the other lesions of the nervous system, may manifest themselves by a state of exaltation of the sensibility—the hyperesthesia of Andral; a state of depression—anesthesia; and a state of perversion—illusions, painful affections.

Examples of an excessive excitability of one or more of the external senses, and especially of the general sensibility, are of common occurrence in patients who have become exhausted by excessive study, watchings, inordinate passions, and may also arise from an entirely opposite class of causes, as indolence, the privation of a customary stimulus, as tobacco, &c. A too rigorous diet maintained during convalescence may determine the same phenomena, as in fact may whatever contributes to the production of a defective or vicious hæmatosis—the nervous system being liable to inordinate excitation just in proportion as it is deprived of its due supply of highly arterialized blood. Hence the irritating effect which prolonged and chronic diseases exert upon the system. Partial or general diminution of sensibility is likewise of frequent occurrence, depending upon some more or less considerable changes in the nerves supplying the parts or in the centres whence they emanate. In considering perversions of the external senses, we must distinguish *illusions* from *hallucinations*. In the production of the latter the brain is alone concerned: while, in the former, the sensibility of the extremities of the nervous system is perverted, and conveys false impressions. A man in a healthy state of mind may be the subject of an illusion of the senses, but his reason corrects the error. This is not the case with the lunatic, and illusions of the various senses are constantly complicating their cases. The only example M. Pinel presents of a perverted condition of the general sensibility is the horrible disease *hydrophobia*, but his description of it is meagre, and presents no novelties. Of perversions of general sensibility accompanied by pain, the various forms of neuralgia, hemicrania, clavis hystericus, rachialgia, &c. are examples. Some of these may become epidemic.

"There prevailed in Paris fifteen years ago an epidemic of local pains in the palms of the hands and soles of the feet, to which the name of acrodynia was given. The patients compared this pain to that produced by the insertion of pins or needles. The skin became red, and insensible, and peeled off in scales. This epidemic was replaced by the influenza and cholera, and has not re-appeared since."

CHAP. VIII.—OF THE CAUSES OF CEREBRAL DISEASES.

Dr. Pinel distinguishes these into predisposing, moral or functional, and physical causes : the last comprehending all the changes occurring in the brain, and the re-actions of the various viscera upon that organ.

Predisposing Causes.

Hereditariness.—The author observes that the brain is one of the organs in which hereditary predisposition exhibits its most fatal influence, and that this is much more marked among the higher than among the lower classes. The highest families of France, obliged by their position in society to confine their alliances within a narrow sphere, have become extinct ; or, where this is not the case, the intellectual powers of their representatives have much degenerated. The tables conjoined to the Reports before us attribute the occurrence of Insanity to hereditary predisposition in a much less proportionate number of cases than it is usually believed to exist in ; but it is often very difficult to ascertain how far this is the case in the poor and ignorant classes to which they relate. Amid the large assemblage of insane at the Salpêtrière, it is not uncommon to see two sisters, the mother and daughter, and sometimes the grandmother. Many members of the same family become mad under the same circumstances, or at the same age. If we could obtain exacter statements, we should doubtless find, that not only insanity, but all the acute and chronic affections of the brain, as apoplexy, epilepsy, &c. are often to be traced to hereditary origin. Great as is the influence of this predisposition, it would be very rash to suppose that children born of parents who have been insane must necessarily become so, especially if only one parent has so suffered. Education and the avoidance of the exciting causes which have proved to be mischievous, may do much in modifying the predisposition. Nevertheless, often it is so strong, that no care will avert the occurrence of the disease, even under the most favourable circumstances.

2. Various other causes predispose, as the *puerperal state* especially. It is not uncommon to see women in the Salpêtrière who have become insane after five or six confinements. The *critical age* is a powerful predisposer to cerebral affections.

"There are also certain dispositions of the mind and character to which the ready development of many cerebral affections must be attributed. Such are the natural infirmities of a weak intellect subjected to the domination of evil propensities, impetuous passions, a direction of the attention to a limited number of speculative religious or political ideas, the anxieties attendant upon most extensive enterprises, the events which fix public attention, and which influence or change the popular ideas. It would not be difficult to retrace, among the admissions into our various establishments, from the period of the Revolution of 1789 to the present time, the form of insanity especially appropriate to the exaltation of ideas prevalent at each epoch." 450.

3. An anormal predominance of certain parts of the brain may give rise to a perversion or exaltation of certain of its propensities, and thus lead to some form of insanity. In acknowledging, in spite of many exceptions, as a general rule, that marked predominance of various regions of the brain is accompanied by corresponding manifestation of certain faculties and propensities, M. Pinel objects to the localization of Gall as too minute, while the relations of the bony vault with the convolutions are too remote and too variable for any practical purposes.

Moral or Functional Causes.

Causes operating by the exercise of the brain's own functions are those which produce its most serious maladies. All writers upon insanity place the operation of moral causes in the very first rank; and thus it is not in the extremes of life, but at those periods when the intellect and passions possess all their activity, that we find the most important diseases of the nervous system develop themselves. Moral causes are as various as the functions of the brain itself, of which, indeed, they are but *exaggerations.*

The great influence of moral causes explains in part the greater prevalence of insanity among women. Even in the Hanwell Asylum, where various circumstances may influence the parishes in sending male rather than female paupers, of the 2,588 admitted between 1831-43, 1279 were males and 1309 females; but in Bethlem, where unrestricted admission prevails, the females have predominated 47 per cent., and in St. Luke's 33½ per cent. Among the admissions, moral causes are also found to be much more proportionately prevalent in the one sex than in the other. This is a reason too for the greater curability of insanity among women.

"Among the various causes, some act instantly, producing at once delirium, convulsions, or paralysis, such as sudden terror, paroxysms of rage, sudden loss of wealth, &c.; while others produce their effects more imperceptibly and slowly. Grief, jealousy, religious creeds, political ideas, only produce an alteration in the cerebral functions by their long-repeated action. In insanity the delirium establishes itself thus gradually, becomes concentrated, and at last only explodes, when reason has lost all mastery over it." 456.

Physical Causes.

M. Pinel describes as the Physical Causes of the Diseases of the Brain, certain changes in its circulation or structure which in ordinary language are represented as the substantive diseases themselves. In fact, it matters little whether we describe, as he has done, first the aberrations of the various functions of the brain, and then refer back to the various changes in the anatomical conditions of the organ as the causes of such; or whether, as is usually done, we term the proximate cause the disease itself, and then describe the different functional derangements it gives rise to. He enumerates as physical causes, Congestion, Inflammation, Ramolissement, Induration, Cerebral Hæmorrhage, Cerebral Œdema, acute and chronic Hydrocephalus, and organic degenerations of the brain, as Tuberco and Cancer. All these are well described at length, but not in a manner to call for farther notice from us. We may, however, transcribe one or two of the author's general observations.

"In diseases of the brain, we may repeat with confidence, the pathological

changes present general and determinate characters; and we must no longer look for identical lesions in identical diseases; for example, that there should be peculiar lesions in insanity, others in epilepsy, others in general paralysis, &c. To seek this is to pursue a chimera which facts do, and will more and more, destroy. In all cerebral affections, acute and chronic, the nervous pulp undergoes successive disorganizations (deformations) which may now be reduced into general laws. But an inevitable consequence of this leading fact, is a result we have many times indicated, and shall not fear to remark again whenever occasion offers; namely, that it is not according to the anatomical nature of the lesion, but accordingly as it involves this or that order of fibrous bundles or protuberances, of which the brain is composed, that you will observe the differences and speciality of these diseases. Accordingly as these fibres or prominences are intelligent, motory, or sensory, as they are more irritable in certain portions of the cerebro-spinal axis than in other portions, and their lesion is solitary or complex, you will have, in proportion to the duration and extent of the lesion, diseases differing much from each other, or complicated with symptoms in exact relation with the lesion, although the anatomical characters may be the same. The diseases of motility may thus have their *seat* wherever there are motory nervous fibres, and the diseases of sensibility wherever those of sensation exist.

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"The acute or chronic symptoms correspond then to the acute or chronic lesions of the nervous pulp. When the alteration is but local or superficial, a very limited disorder of intelligence, locomotion, or sensibility, is produced. When it is more extensive, and penetrates deeper into the cerebral mass, the disordered condition of the three functions is more pronounced: delirium complicates the lesions of motion and sensation which are expressed by permanent symptoms, as in paralytic cerebritis. When the sensitive and motory fibres, which are in so intimate connexion throughout the mesocephalon, are simultaneously attacked, and the progress of the disease is more or less acute, you observe all the spasmodic and convulsive affections; and when the disease is more chronic or intermitting, the various epileptic and hysterical phenomena. In order that convulsions should be produced, there must be simultaneous lesion of the sensitive and motory nervous fibres."

Of *Ramolissement* occurring in the *aged*, M. Pinel observes:

"Ramolissement has been observed at every epoch of life; in the infant, as well as in the adult and the aged. It is tolerably frequent, especially towards autumn, in the infirmaries of the Salpêtrière, and there presents in its progress and its anatomical characters the effects and traces of the general debility of old age. It is rather a senile decomposition than an inflammatory process. This is the case with almost all the phlegmasiæ of the aged: for, in them, pneumonia is latent, without cough, pain, or expectoration; and erysipelas is indolent, requiring stimulation. So with cerebral ramolissement, it is asthenic, not having the power to become inflammatory."

Chap. IX.—Treatment of Cerebral Affections.

This is naturally divided into three portions.

"1. The *therapeutical* treatment comprehends all descriptions of medication suited to combat the diseases of the brain, especially at their commencement, so as to prevent their passing into the state of incurability, and the access of the fatal complications which do not fail to follow. It seeks the best curative indications according to the number and gravity of the symptoms which present them-

selves. This treatment should be more active than it has hitherto been, since we find nearly all the diseases of the brain degenerate into an incurable state.

"2. The *functional or moral* treatment, which is the opposing certain ideas by other ideas or emotions, is applied with success to chronic or partial insanity, monomaniæ arising from superstition or vanity, &c.; in which the brain, having formerly suffered a slight lesion, continues incapable of reasoning by the force of habit or want of exercise. Such patients are often met with in large establishments for the insane, as well as among the higher classes of society.

"3. *Hygienic* treatment especially concerns those individuals whose malady compels a complete isolation—the insane, whose material condition we must render as favourable as circumstances will admit of. Hence the necessity of hygienic regulations for the arrangement of receptacles, and for the due classification of the inmates, the management of the diet, exercise, employments, and all other things which concern these patients." 494.

We need not quote M. Pinel's mode of treatment of the various other cerebral diseases, which has in it nothing peculiar; but will confine ourselves to his observations upon the treatment of the insane.

Treatment of Insanity.

Therapeutical. *Bloodletting.*—Although this is required in acute or furious mania, it requires to be used with caution, as melioration from its employment is often of short duration, and, if it be too long persisted in, the gravity of the case becomes augmented. In women whose catamenia are suppressed, we should apply leeches to the thighs at their usual periods, when an exacerbation of symptoms always takes place. General bleeding, which may be required at the outset of the case, must afterwards be replaced by leeches, or cupping, applied to the back of the neck, the thighs, or region of the heart. General bleeding is very seldom employed in Bethlem, or other English asylums.

Tepid Baths, used for prolonged periods, applying at the same time cold to the head, are attended with great advantage. *Cold* baths and the *douche* are of much more questionable utility, frequently giving rise to pulmonary or cerebral congestion. The douche has enjoyed an undeserved celebrity.

"If some success has been obtained from this procedure as a means of correction, I can unhesitatingly state that the effect is almost always the contrary to that which has been desired. At the Salpêtrière the employment of the douche is a constant cause of exacerbation. The patients become excited, vociferate and abuse those who administer it: or sometimes supporting it with a forced calmness, which is no less hurtful. I have observed women bear it better than men: at the Bicêtre it cannot be practised even for a short time without producing a state of congestion, or causing the patient to express the most terrible suffering; but, at the Salpêtrière, women are seen to bear it for more than a quarter of an hour without any emotion being caused, while others defy its effects and tire out the physician. As a curative indication it is a means whose consequences are dangerous, by reason of the intestinal and pulmonary congestions it produces. Better effects may be obtained from a narrow streamlet, or from water falling guttatim, the patient being placed in a comfortable manner in his bed. The application of ice to the head is an excellent means of calming irritation of the brain." 499.

Dr. Conolly states that the douche is now seldom resorted to at Hanwell, producing no good effect beyond that of the shower-bath, and distressing the patient much more. He finds the *shower-bath* the most effectual means of subduing violent excitement: the patient being placed up to the middle in warm water. Its application is however somewhat difficult, and it should seldom be employed as a punishment.

"It should be suspended when the patient appears overcome, and instantly renewed when symptoms of violence occur. A strong shower, continued even for a minute, has sometimes considerable effect; and it is never many minutes prolonged without careful observation of the patient's state. After four or five applications of this kind, the patient becomes entirely subdued; and should then be taken out of the bath, rapidly dried, warmly covered up, and put into bed, with every possible demonstration of kind attention. Calmness and sleep are the usual results: and more permanent effects frequently follow. A bath of this kind seems to produce a moral as well as a physical impression; being succeeded, in recent cases, by tranquillity for a few days, and in chronic cases, by quietness and improved behaviour for many weeks, and even for months."—*2d Report.*

Purgatives.—These have enjoyed a reputation in the treatment of mania for ages. Their use, during its acute stage, requires circumspection, as the intestinal mucous membrane often participates in the general excitability. When the nervous action seems blunted or suspended, we may proceed more boldly. Various mild aperient drinks are desirable.

Emetics have been much vaunted, but they have been often employed at the Bicêtre in large doses with little avail. They are most useful in small doses in cases of mild melancholia, slight hysteria, and attacks of nervousness in women.

Counter-Irritation.—In the acute stage exutories are of little avail:—but they are of use at a later period, and especially in puerperal mania. Much has been said of the application of the actual cautery to the nucha or to the crown of the head. The author has frequently seen it employed by Esquirol, with little or no effect, unless a moral one, when it excited fear. Small derivatory effect results, as little or no suppuration follows the fall of the eschar.

Dr. Conolly speaks highly, in cases of excessive excitement, of shaving the head and applying the ung. ant. tart. freely to the scalp. All natural derivations are useful, as cutaneous eruptions, a loose condition of the bowels, the menses, hæmorrhoids, &c.: and when these are absent, in the chronic stage, large exutories producing abundant suppuration should be maintained.

In the case of *Illusions*, medication may be directed more immediately towards the affected organ: thus, in illusions of the organ of hearing, applications may be made to the mastoid process; and in those of vision, the ext. belladonna may be given.

Sedatives.—Opium, M. Pinel thinks, produces rather than allays excitement. The Commissioners in Lunacy found a difference of opinion to prevail among the medical directors of the various asylums as to the value

of this drug; but, upon the whole, they consider the practice of giving it is considerably gaining ground. Dr. Conolly has found it of utility; sometimes giving it only at night, and at others in repeated doses in the day. Grain doses of the acetate of morphia at night, and smaller portions in the day, have been given. Upon the whole, he prefers the *hyosciamus*, giving it in two-drachm doses at night. He adds—

> "But it should never be forgotten in a lunatic asylum, when a patient is noisy at night, that a copious draught of cold water is often a better sedative than any medicine. By this means, and by allowing the patient to wash his hands and face, and by a quarter of an hour's quiet conversation with him, and by causing his bed to be re-adjusted, a patient may occasionally be tranquillized, who would otherwise disturb his neighbours for hours. In other cases, the unexpected offer of a little bread and meat, or bread and cheese and beer, is very successful, although it has not been thought expedient very often to resort to it. These trifles are important, not merely because they give the patient a quiet night, but because they also interrupt the habit of being noisy in the dark."

M. Pinel criticizes the treatment of insanity recommended by the late Sir W. Ellis, whom he cites as our most recent author, and elevates into a rank as an authority among us we were not aware he possessed. Indeed, he seems to be under serious mistakes as regards English practice in insanity, when he states it is wholly guided by phrenological ideas, and consisting in a multifarious employment of drugs—*la polypharmacie des Anglais*. Mercury, he tells us, carried to salivation, is in constant employment by both British and American practitioners! Notwithstanding these his exaggerated objections, he recognises much in the active employment of blood-letting recommended by Ellis, (but we think scarcely sanctioned by our best practitioners,) at the commencement of the disease, which renders it very superior to the expectant plan prevailing in his own country, as tending to prevent the relapses which are often so fatal, even when the original attack may be recovered from.

MORAL AND HYGIENIC TREATMENT.—Passing by the excellent general observations of M. Pinel upon this subject, for which we have not space, we may advert to some of the particulars.

Separation.—The separation of the lunatic from all his habitual associations, his friends, relatives, servants, &c., is a most essential preliminary, and the difficulty which attends the attempt to cure the rich in their own abode is well known. By this isolation the invalid is removed from the influence of some of the primary causes which have affected him: and he is spared the sight, always a painful one to him, of those who were first witnesses of his infirmity. This too is the only mode of ensuring his quiet obedience to the directions of his physician. The novelty which surrounds him is a salutary diversion, operating usefully by exciting that spirit of curiosity so conspicuous in the insane. Persons not practically acquainted with lunatics have feared this separation from all their friends would prove a cause of grief, aggravating their condition. There is, in fact, no better mark of insanity than the loss, or perversion, of the natural feelings. So too, it has been thought that the sight of other insane persons would act prejudicially upon them. This is a mere chimera. The feeling of

astonishment which usually seizes the lunatic when first brought amid the insane usually proves beneficial, and he at once sees that he shall be obliged to become obedient. He looks up to his physician as his guide and support, soon becomes familiar with the attendants, but very rarely with the other patients. This repugnance which the insane feel towards each other wears off as convalescence approaches. M. Pinel states that the French law is sufficiently stringent to render it impossible for sane persons to become immured. In our own country, however, the Commissioners, during their recent tour, have liberated persons who ought never to have been confined.

Cerebral Education.—By this term M. Pinel designates the employment of the various means for combatting the perverted condition of the faculties of the insane. To carry it out requires, on the part of the physician, great elevation of mind, infinite patience, and great powers of observation. All his subordinates must understand the objects he has in view, aid him in carrying them out, and supply his place when absent—so that a continuity of action may be maintained, which will effect much more than he is able to accomplish himself during his short visits.

"A general error prevails, that a lunatic must not be contradicted, and that we should give way to his delusions for fear of exasperating him. This fatal compliance is, of all things, likely to confirm the insanity, and that it should not be indulged in is a principal reason for removing him from his home. We must then oppose ourselves to his habitual delusions, but it requires much tact to do so with effect, and to know when to suspend our opposition.

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"An infallible means of education for convalescents is to bring them much together, both during the period of their working hours, and that of their meals and recreations. The intimacies, emulation, and distraction thus procured are of great use, and the absence of such renders the treatment of rich patients so much more difficult. During convalescence, too, the properly regulated visits of friends, when not commenced too soon, are of great utility in restoring the mind to its natural affections and aptitudes. It must never be forgotten, however, that the brain, like any other diseased organ, can only be permanently restored by degrees, and that any precipitancy in employing it upon the exercise of its faculties will retard the cure, or cause relapse. In certain forms of partial, chronic, and calm insanity, the moral treatment may be carried to a more daring extent than is ordinarily justifiable. This is the case, however, only with visionaries, monomaniacs, and melancholics, in whom no organic lesion can be detected. Such persons must not be left too much at rest, and the infliction of pain may be required to arouse the mind from lethargy, or to subdue a dominant idea. The *douche* is the fittest instrument by which this can be effected; but this is only one out of others, the general system being that the life of the patient shall be rendered agreeable only in proportion as he consents to follow the counsels of the physician. At the same time, he must be encouraged to occupy his mind in any way likely to break through the chain of dominant ideas."

This is very questionable practice; and the application of force as a means of conquering delusions is, we believe, entirely repudiated in this country, and certainly the principle, if carried out, might easily lead to the grossest abuses.

M. Pinel observes, that moral treatment may, in large establishments, be successful in apparently hopeless cases. In these, there are always a

large number of patients reputed incurable, who are only so because attempts at their melioration have never been put into force; and neglected by their friends for numbers of years, they have sunk into a state of listless contentment with a situation in which their physical wants are supplied, and they realize a portion of imaginary happiness. Many continue mad merely because they remain among the insane: and from habit, idleness, and fear of having to labour, are content to remain where they are. Such patients may be advantageously submitted to moral treatment after years of confinement, and may require to be subjected to the rudest tests, to oblige them to resume their reasoning powers.

"It is often sufficient to thrust them out of the hospital in spite of themselves. Being at the Salpêtrière, I was struck with the repugnance which a great number of these persons manifested at recovering their liberty, and re-entering the world. Convinced that indolence was the chief cause of this, I proposed to M. Pariset and the administrator to make an extensive experiment. I pointed out to them seventy-two patients, chosen from among those who had been for years reputed incurable; and they were all turned out. Of these, three only returned—the rest finding a means of livelihood." 540.

It is probable that many of these persons had never been mad at all, but sought refuge in this establishment as our poor do in a workhouse.

Arrangements of an Asylum.—The author, referring to his larger work upon the subject, offers some observations upon the most appropriate construction of an asylum. These we can only allude to as useful for consideration in conjunction with the numerous suggestions offered by the Commissioners in Lunacy in their Report, derived from the contemplation of the defective state of existing structures in this country. This is a highly important subject just now, when the necessity for increased accommodation for the insane is about to be practically acknowledged. The Commissioners pronounce numbers of existing buildings as positively unfitted for their purposes, and few, if any, are without serious positive defects as regards airing-grounds, sleeping-rooms, &c., or some other important particular. They insist upon some arrangement being entered into for the due classification of patients, which is neglected even in the best-conducted asylums, to the great sacrifice of the comfort of many of the patients, and the retardation of the cure of others. Dr. Pinel proposes the distribution of patients into six classes:—1. Convalescents. 2. Quiet lunatics under treatment. 3. Incurable quiet lunatics and imbeciles. 4. Incurable unquiet lunatics, and epileptics. 5. Furious lunatics in cells;—and 6. The infirmary for accidental diseases and paralytics. Improved arrangements are also required for the admission and discharge of lunatics. It is well known that insanity is curable in a large proportion of cases, when treatment is commenced early, which, if its application had been delayed, would have resisted all measures. "The probability of effecting a cure in the case of a patient who is admitted within one month, is," says the Report on Bethlem, "just double that of one who has been admitted within two months of the commencement of the complaint." Mr. Tuke states, that of 63 cases admitted during the first three months, 51 recovered: of 65 between the 3d and 12th month, 28; and of 101 after the first year, but 31. It is then a lamentable fact, that the vast

majority of pauper lunatics are detained in workhouses, possessed of no means of treating them, until the period of cure has passed away: but once sent to the asylums, and even when found incurable, they are allowed to remain there for years, so that these establishments, instead of being places for the cure of insanity, become expensive receptacles of incurable lunatics. The Commissioners state that, out of 984 patients in Hanwell at their visit, only *thirty* were accounted curable! This is indeed a crying grievance. The poor lunatic, often on account of the parsimony of his parish, is only sent at an advanced stage of his disease, when cure is hopeless, or, as often happens, when death is imminent; while the rate-payers are obliged to pay for the prolonged maintenance of old, incurable cases, which might be as well provided for in far less expensive establishments. Except under peculiar circumstances, the asylums should be places for early resort and limited residence.

The commissioners forcibly object to the large *size* of some of the asylums, as Hanwell, rendering the proper disposition of the departments and the due governance of the institution difficult, and the duties of the officers onerous. They consider from 200 to 250 beds as the most convenient for all purposes. We think their objection a valid one.

It is a matter for congratulation that these institutions are about to be converted into *clinical schools* for the observation of the diseases of the mind. It seems almost incredible that the rich field for study which the metropolis supplies should have been so little cultivated, that, with the exception of Sir Alexander Morison, no one, that we know of, has ever delivered a course of lectures upon the subject, until the recent ones of Drs. Conolly and Sutherland. Sir A. Morison's lectures were commenced in 1823, and continue to the present time; and the fact of only 150 gentlemen having attended them during this long period, proves how little alive medical men have been to the importance of the subject. The consequence is, that the treatment of the insane has been, until quite recently, converted into a speciality, enveloped in mystery, conducted with unnecessary harshness and privations, and frequently placed in the hands of persons whose interests ran counter to those of their patients.

All authorities agree in the importance of the office of the *medical superintendent*. His must be an undivided, an omnipotent authority, to which all subsidiary arrangements must be subservient, so that the plans he adopts may be harmoniously carried out in every circumstance that regards the lunatic. The obstacle a very large establishment offers to this, and to the patient being brought sufficiently often in contact with him, is obvious. "He shuts himself up amidst his patients," says M. Pinel, "and consecrates almost every instant of his life to their service, the better to observe, and by observing, to learn to relieve their infirmities. Such an abnegation can only result from the possession of a most elevated mind, and requires the possession of a particular organization, as well as a commanding presence." Whatever qualities the physician may possess, however, single-handed he can do but little, and it is one of the best features of the modern humane system of treatment, that *female co-operation* is so much appreciated. The Reports before us contain well-deserved encomia upon the valuable services rendered by the matrons of the various establishments they relate to. Now, the revolting appliances formerly in vogue are rapidly

disappearing, the kindly nature, ready tact, and fertility of invention so eminently possessed by woman, will accomplish much which they failed to achieve. A chief difficulty in carrying out improvements in the treatment of the insane, has been found in the deficiency of intelligent and humane *attendants* (olim keepers). This the more so, since the diminution of the employment of mechanical restraint, has rendered a greater proportionate number necessary. A superior class of persons can only be induced to undertake so laborious, anxious, and repulsive a situation by the prospect of good remuneration and kind treatment; and, when we consider how much the well-being of an asylum depends upon their exertions, we must allow that their remuneration can scarcely be too high. However well disposed, persons in this rank of life do not always possess the aptitude and requisite information, and we think Sir Alexander Morison's plan of delivering a course of lectures to them upon their duties, worthy of imitation. M. Pinel states that we have normal schools for this purpose in England which are very successful. Of their locality we are ignorant. A well-regulated asylum is the best of normal schools.

An important appendix to a lunatic asylum is a *convalescent* establishment. The lunatic who is cured frequently has no means of re-entering society if he is abruptly discharged from the asylum. Some establishments allow the patients to return to meals and at night, for a while, and others furnish them with money, as the Adelaide fund at Hanwell. M. Pinel speaks highly of the excellent results which have followed the establishment of a large farm for the temporary reception and employment of those discharged from the Bicêtre.

Restraint.—Upon the extent to which employment of this should be carried, M. Pinel is entirely silent, which is surprising, considering the position his father assumed upon the question, and the great attention the subject has excited during the last five years. The *practicability* of totally abolishing all mechanical restraint in asylums chiefly destined for the reception of chronic cases of insanity, has been completely demonstrated at Lincoln, Hanwell, and Lancaster. That, however, whether as regards the lunatic himself, his attendants, or his fellow-patients, its indiscriminate proscription, especially in establishments where only recent, and often violent, cases are received, would be most injudicious, we have often stated in this Journal: and we are glad to find that the dispassionate inquiries of the Commissioners have led them to the adoption of a similar view. They state that the opinion is unanimous upon the part of the superintendents of insane establishments that the condition of the insane has improved in proportion as mechanical restraint has been disused. In point of fact, it is nearly practically abolished in public receptacles. In 17 of these, containing 2868 patients when visited, there were but 24 persons under moderate restraint; and while the weekly average at Bethlem was 11 in 1839, it was only 3 in 1843. But few medical officers, however, approved of the power of using it being totally withdrawn, and the Commissioners relate several examples of serious accidents resulting from its total disuse. Upon the score of humanity, Mr. Tuke, and numerous other well-qualified observers, prefer its mild employment, as subduing impetuosity with least suffering to the patient. The Commissioners upon this point observe:—

"In those cases where the patient is overpowered by a number of keepers holding his hands during a paroxysm of violence, it is said there is no mechanical restraint. Here restraint of some sort or other is manifest; and even in those cases where the patient is forced into a cell by manual strength, and prevented leaving it until his fit of excitement shall have passed, it is difficult to understand also how this can be reconciled with the profession of abstaining from all restraint whatever, so as to be correctly termed 'non-restraint.' It seems to us that these means are only particular modes of restraint, the relative advantages of which must altogether depend upon the results."

They likewise offer a proper caution respecting the *Seclusion* of the patient, which is the substitute for restraint in case of violence.

"As a temporary remedy for very short periods, in cases of paroxysms of high excitement, we believe seclusion is a very valuable remedy. We are convinced, however, that it ought to be used only for very short periods, and that it should not be permitted as a means of managing and treating those persons who are permanently violent and dangerous."

The universal abandonment of restraint would be attended with great expense in employing additional attendants without corresponding advantage, but the contrary, and in private establishments would be impracticable. Its abuse must be guarded against by its infliction requiring the sanction of the physician, and its duration being faithfully recorded. The same precautions are required when seclusion in dark cells is employed.

Employments and Amusements.—The importance of these can scarcely be exaggerated, and it is chiefly to their greater development that the improved condition of the insane is attributable. The Commissioners regret that so very large a proportion of lunatic establishments possess insufficient (and several none whatever) accommodation for out of door exercise and employment. Even did not these measures tend, as they most markedly do, to augment the chances of recovery, they would still be invaluable in the eye of the philanthropist, as conferring a share of modified happiness upon beings heretofore deemed incapable of all but mere sensual enjoyments. Pinel fully confirms the statement of observers among ourselves, especially as regards the value of manual labour. Unfortunately there are many patients whose interest can scarcely be excited by any means, owing in great part to their ignorant condition prior to the occurrence of the attack. To these, and others, much benefit has accrued at Hanwell by the endeavour to instruct them in reading and writing; and, although the experiment has only been tried on a small scale, it has been attended with marked success, which is the more gratifying as the results may be of great utility to the individuals after a cure has been effected. Music, it seems to us, has been insufficiently resorted to in this country.

Religious Services.—These, when it is considered how often perverted religious ideas give rise to insanity, would seem, *à priori*, inappropriate in a lunatic establishment. If all were admitted indiscriminately to partake in them, such would be the case; but where due care has been made in selecting the individuals, and due discretion that the service shall not be too prolonged or too exciting, unmixed good has arisen, according to the testimony of all where the experiment has been tried, a degree of decorum

being maintained, incredible to those who had not witnessed it. "The effect," say the Commissioners, "is tranquillizing, and productive of good order and decorum, in a remarkable degree, and in some instances permanently beneficial." M. Pinel chiefly employs this means in convalescence. "Among these unfortunate beings there are many who regain with their reason the desire for those religious observances they have been accustomed to, and who derive from their practice hope and resignation." The Commissioners observe, however, that religious books often form too large a proportion in the libraries provided for the insane. This, and the propriety of admitting particular individuals to join in the services, should be under the complete control of the medical superintendent.

Diet.—The lunatic has frequently an excellent and sometimes a voracious appetite. All modern observers agree that his diet should consist of a larger proportion of solid and nourishing food than was formerly deemed fitting. The dietaries of most establishments have been augmented with advantage to the well-being of the patients. As in all large assemblages of poor persons, those of pauper asylums are not sufficiently varied in the description of aliments employed, while the omission of tea and sugar must often be felt as a severe privation. Bethlem Hospital has recently gone to great expense to furnish these luxuries (?) to the inmates of that noble establishment, many of whom belong to a rank of life above that of the pauper, but yet are too needy to bear the expense of purchasing them.

DES ABCES PHLEGMONEUX INTRAPELVIENS. Par M. *Marchal* (*de Calvi*). 8vo. pp. 191. Paris, 1844. Bailliere.

THIS subject of pathological inquiry—the formation of purulent deposits within and around the Pelvis—has not, as far as we know, been made the theme of any distinct treatise in the medical literature of this country. There are many able papers or short memoirs on certain branches of the subject to be found in various surgical and obstetrical works; but we have no summary or digested account in our language of the most important of these memoirs, nor any comprehensive description of the very serious, and, often too, very perplexing, malady which they are intended to illustrate. The French pathologists have done much more in this field of research than our countrymen; the valuable writings of *Puzos*, *Levret*, *Raulin*, *Doublet*, *Husson* and *Dance*, *Dupuytren*, &c. &c. being the chief sources to which we must refer for information. Dr. *Lever*—of whose valuable paper, in a recent number of the Guy's Hospital Reports, we gave a summary in this Review for last July—deserves well of his professional brethren for having directed their attention to a class of cases that are far from being generally well understood; and we trust that, ere long, he will again make public the results of his further experience. The present work by M. *Marchal* cannot fail to be acceptable, inasmuch as, by bringing

together a large number of scattered reports, he enables the reader to judge for himself of the value of the deductions which he has drawn from them. We shall now endeavour to give as fair and faithful a review of its contents as we can, avoiding all unnecessary discussion, and confining ourselves chiefly to a condensed exposition of its most instructive contents.

As by far the greater number of cases of Intra-pelvic Abscess occurs in the puerperal state, our attention shall be chiefly directed to this form of the disease. The subject well deserves the serious study of every obstetrical practitioner; as there is often no little ambiguity in the symptoms, and it will require no ordinary tact to discriminate the true nature of the malady in its incipient stage. We trust that the following remarks may serve to throw a little light upon a somewhat obscure topic, and that even the most experienced of our readers will find, in their perusal, some suggestions that may have escaped his notice.

We shall first consider—

The Seat of Intra-pelvic Abscesses.

Purulent matter may be formed, and collect in various parts of the pelvis. One of the most common is the cellular tissue in the iliac fossa, between the peritoneum and surface of the *iliacus internus* and *psoas* muscles: in such cases, the abscess is said to be *sub-peritoneal.* In other cases, the pus is situated between the layers of the broad ligaments of the uterus, or in the vesico-uterine, or utero-rectal spaces; but still under or outside of the peritoneum. Occasionally it seems to be formed in the substance of the uterus itself; but, oftener, in that of one or both of the ovaries, or it may be within the Fallopian tubes. Not unfrequently it is secreted from the inner or serous surface of the peritoneum, investing the womb and the adjacent organs; but, under these circumstances, the disease or lesion cannot with strict propriety be called an "abscess," *i. e.* a circumscribed deposit of purulent matter. Nevertheless, we shall afterwards find that certain purulent effusions of this nature have several points of resemblance with the subject of our present remarks, and we shall therefore briefly notice them. In a remaining set of cases, the intra-pelvic abscess is situated in, and confined to, the substance of the *iliacus internus* and *psoas* muscles, and their aponeuroses; the sub-peritoneal cellular tissue being then only secondarily or consecutively affected. We shall not at present allude to any other forms or localities of the disease; as we are unwilling to perplex the subject of our remarks by over-minute pathological subdivisions.

Where do the abscesses usually point? By keeping in view the few preceding remarks, the reader will find little difficulty in almost anticipating the answer to this question. When the abscess is situated in the iliac fossa, it usually points in the groin; when it occupies the substance of the psoas and iliac muscles, the pus generally works its way down to the upper and inner part of the thigh: more rarely, the abscess makes its appearance in the lumbar region. If the matter has formed in the broad ligaments of the uterus, or in any of the other intra-pelvic folds of the peritoneum, it will, in all probability, eventually burst either into the uterus

or vagina, or into the bladder, or into the rectum; or, it may be, into the cavity of the peritoneum. We shall now illustrate these different terminations by cases selected from a variety of authors. The pointing of the abscess that is formed in the iliac fossæ, is of such frequent occurrence that our only reason for adducing an example of it is, to show that this morbid state was not overlooked by the old authors.

Case.—"On the 28th of March, 1682," says Mauriceau, "I visited a woman who had been confined two months before, and in whom there had appeared a swelling in the hypogastrium, extending into the right groin. It was caused by the grosser portion of her cleansings, which, from not being sufficiently discharged, had become detained in the sides of the womb and its ligaments: these parts were much swollen, and gave rise to severe suffering. At length, an abscess was formed in the groin; it was opened by an incision, and gave issue to three cupfuls of a purulent matter that was not unlike the lees of wine. After this large swelling had continued suppurating for five weeks, the patient began to improve rapidly; ultimately she quite recovered from a disease that had put her life in great danger."

M. *Marchal* has collected together the histories of at least two dozen cases of this description, where an abscess formed in the one or the other groin of puerperal women. Several of Dr. *Lever's* cases also belong to this class.

As an illustration of the pathological anatomy of a puerperal abscess seated in the iliac fossæ, it will be useful to notice here the leading features of a case that was reported to the Anatomical Society of Paris, about ten years ago, by M. *Berard*. The woman had been seized with violent pains in the hypogastrium after her confinement. The existence of a purulent deposit in the iliac fossa had been suspected during life. On dissection, there was found a vast abscess, which commenced at the back and upper part of the left flank, between the abdominal parietes and the colon, and extended into the hypogastrium, passing between the iliac fossa and the gut; but always keeping on the outside of the peritoneum. The matter had worked its way towards the right iliac fossa—separating the peritoneum in the hypogastric region—and thence had mounted, in the direction of the median line, as high up as the umbilicus. At this part it pointed.

In the left flank there was found a communication between the abscess and the cavity of the descending colon by a small rounded aperture.

It is difficult to determine in this case whether the intestinal ulcer was the *cause* or the *effect* of the enormous abscess that had gradually formed. Whatever opinion may be held on this point, let not any of our readers imagine that puerperal iliac abscesses are generally, or even often, so serious and alarmingly dangerous as was the one in the present instance. In the greater number of cases, where such an abscess points in the groin, provided there is no lesion of any internal part, we may have good hope as to the result, if the patient's constitution be moderately sound.

That an intra-pelvic abscess sometimes opens into the vagina, will appear from the following case, that is interesting in a two-fold point of view.

Abscess in the broad ligament, artificially opened from the vagina; also abscess in the groin; cure.—A young woman was admitted into the Hôtel Dieu, five weeks after her confinement with her first child. A tumour had formed for some time on the left side of the hypogastrium; she had suffered

from fever, vomiting, and considerable pain during the acts of defæcation and micturition. By examination *per vaginum*, a sense of fluctuation was discoverable behind, and on the right side of, the uterine orifice. M. *Recamier* made an incision upon the most prominent point of this fluctuating swelling, and gave issue to a large quantity of healthy pus. Two days subsequently, a tumour appeared in the right groin, above Poupart's ligament, and gave rise to severe pain whenever the limb was moved. Next day, fluctuation was perceived in it: the vaginal wound had already nearly cicatrized. Two small bits of caustic potash were applied to the swelling; and, on the second day after this application, an incision was made through the gangrenous integuments, and a large quantity of fetid thin pus was discharged. In the course of three weeks, the wound had closed.

M. *Bourdon*—in his valuable paper, "Des tumeurs fluctuantes du petit bassin, et de leur ouverture pratiquée par le vagin," in the Revue Medicale for 1841—has related a curious case where the fluctuation was perceptible both by the rectum and the vagina: the projection of the abscess into the gut had for some time caused a most obstinate constipation. It was opened by an incision from the vagina, and a cure was speedily effected.

MM. *Husson* and *Dance* also have described a case where the pus, that had formed in the cellular tissue of the broad ligaments, found itself a way through the substance of the cervix uteri, in which there was an irregular opening leading directly into the purulent sac.

It is to be observed that, in the cases now alluded to, the abscesses had formed external to, or *without*, the walls of the vagina; and had burst, by the usual process of ulceration, into the cavity of this canal. In other cases, however, where a gush of purulent matter has issued from the vagina, it has doubtless come down directly from the uterus; the abscess having most probably been formed in the muscular tissue itself of this organ, and eventually becoming discharged into its cavity. This indeed seems to have been the process in several of the observations recorded by our author, as well as in two or three of those narrated by Dr. *Lever*.

Several instances of intra-pelvic abscesses bursting into the *rectum* are reported by our author. His 34th case is a good example of this termination.

A young woman, about nine days after her first confinement, was exposed to cold, and became feverish in consequence. A few days subsequently, she began to complain of pain in the hypogastric and left iliac regions, in which a firm and very sensitive swelling, as big as an orange, was discoverable. By the application of leeches, and afterwards of mercurial ointment, the tenderness, but not the size, of this swelling subsided. Six weeks later, a quantity of pus was evacuated with the stools, and the patient became at once relieved from most of her former sufferings.

A somewhat similar case is reported by M. *Bouchut* from the practice of Professor *Trousseau*. It occurred in a young primiparous patient, in whom the right iliac region became the seat of a very painful phlegmonous inflammation. There was every reason to believe afterwards that pus had formed in the swelling, and had burst into the descending colon or the rectum. Madame *Boivin*, also tells us of a woman in whom, after severe pain for some time in the hypogastrium and left groin, and the appearance of a swelling there, upwards of a pint of purulent matter was one morn-

ing discharged by the rectum, in consequence of the patient's hard straining at stool.

The rupture of a pelvic abscess into the Urinary Bladder is of still more rare occurrence. The following case is adduced by our author as an instance of this lesion. It is headed thus:—

Vast purulent collection, the consequence of accouchement, occupying the pelvis, the left iliac fossa, and the upper part of the thigh, opening spontaneously into the bladder: cure. The swelling in the groin was at first hard and resisting; gradually it became softer, and at length a distinct fluctuation was felt in it. Much difficulty had been experienced by the patient in voiding her fæces and urine. After several days of severe suffering, she discharged a large quantity of pus with the latter excretion: this purulent admixture continued for upwards of ten days. The iliac swelling had by this time nearly quite subsided. An abscess subsequently formed at the upper and inner part of the right thigh: this was opened, and discharged a good deal of pus. Eventually the patient recovered her health, after three months' treatment.

The 48th case of our author is still more remarkable; as, there, the abscess had a double opening; one into the bladder, and the other into the rectum. It had originally formed in the right iliac fossa, and seems to have been of very large extent. After severe suffering for a considerable time, the patient began to discharge purulent matter, first with the stools, and subsequently with the urine; the size of the swelling decreasing at the same time.

In the case that immediately follows, there seems to have been an equally curious complication of lesions present: it is styled, *abscess of the left iliac fossa, the consequence of delivery, opening into the bladder and the vagina.* It is unnecessary for us to follow the particulars of the report. Suffice it to say, that the patient recovered; although there still remained a good deal of swelling and tenderness in the pubic and left iliac regions, when she left the hospital. The quantity of purulent matter discharged along with the urine, and also from the vagina, had been very large.

As we might *à priori* expect, a pelvic abscess occasionally bursts into the cavity of the Abdomen: then it almost always proves fatal. In the 39th case of our author, an abscess had formed between the urinary bladder and the uterus; it opened into the abdomen, inducing a rapidly fatal peritonitis. The very next case is of a similar nature.

We have already said that purulent matter is sometimes originally secreted from, and contained within, the peritoneal lining of the pelvis;—a not unfrequent result of a partial Peritonitis after delivery. Such morbid effusions, we need scarcely add, are always of very grave import; but, let it be remembered that, even under this unfavourable state of things, the case will sometimes terminate well.

Here is a very interesting example of this lesion, recorded in the old Journal de Medecine for 1789; it is headed, *Puerperal Fever, followed by effusion into the abdomen and by an enormous deposit.*

A lady of rank became pregnant of her first child in her 24th year. The labour was tedious and difficult. On the second day she became feverish, and the hypogastrium was swollen and painful. The pyrexial mptoms subsided, but the swelling increased; and, at the beginning of

the third week there was a distinct fluctuation perceptible within the abdomen. Paracentesis was performed, and nearly six *livres* of a viscid and fetid fluid—containing numerous caseous flocculi, which sometimes obstructed the orifice of the canula—were discharged: a good deal of gas escaped at the same time. In the course of a few days, the belly became tender and swollen; and a sharp pain fixed itself in the umbilical region, where a small tumour, of the size of a nut or so, was to be felt. As this manifestly contained fluid, it was opened, and about a wine-glassful of sero-milky pus let out: there was no communication between this abscess and the cavity of the abdomen. "Four days subsequently," adds the Report, "the peritoneum suddenly opened, (at the seat of the puncture, we suppose,) and a thick grayish-coloured matter, loaded with a quantity of soft flocculi, flowed out in a stream for a quarter of an hour: its odour was fetid and cadaverous. The discharge returned next day, and, again, several pounds of an offensive thick fluid escaped. This enormous deposit emptied itself, by partial evacuations, in the course of five or six days. The abdomen subsided; and all that remained was a fistula at the umbilicus, which closed several times, and gave rise to various troublesome accidents, before it finally healed: this event did not take place until the end of the sixth month. Since that time, the lady has enjoyed very passable health."

Another case is quoted from the practice of Professor *Dubois:* in this, after symptoms of metro-peritonitis, there occurred an extreme tension of the abdomen, and also a small fluctuating tumour in the groin. This was opened, and an enormous quantity of fluid was evacuated: the discharge continued for several days, and the patient gradually was restored to health. In 1763, M. *Doulcet* has recorded a case in which upwards of six pints of a fluid, having all the apparent qualities of milk, were evacuated by paracentesis from the abdomen of a woman, three weeks after her delivery. An abscess subsequently formed in the umbilical region, and discharged a milky-looking pus.

De la Motte has preserved the particulars of a still more singular case, in which an opening in the abdominal parietes took place spontaneously, and gave issue to a pailful of purulent matter. The patient recovered her health so completely, as to have several children afterwards.

Having now sufficiently discussed the subject of sub-peritoneal and intra-peritoneal puerperal abscesses, we shall proceed to notice very briefly that variety of intra-pelvic abscess, which is primarily formed in the substance or tissue of the *iliacus internus* and *psoas* muscles, and which our author designates by the appellation of *psoite puerperale.* As a well-marked illustrative example of this dangerous lesion, he has adduced the following case.

A woman, 30 years of age, was affected, soon after her tenth confinement, with severe pains in both flanks, but especially in the left one. The lower extremity on this side became much retracted, so that its extension was almost impossible. The patient was feverish during the day, had night sweats, and lost her strength rapidly. About the end of the second month after her accouchement, a tumour was perceptible in the left flank. When first examined by her medical attendant, it was soft, elastic, about as big as the closed fist, and situated equidistant between the iliac crest and the last false rib, two or three inches from the vertebral column.

Anteriorly, the swelling was insensibly lost in a diffused doughy-like fulness, which extended over the whole of the left flank and iliac region. When pressure was made on the lumbar swelling, the reflux of fluid into the flank on this side was distinctly perceptible. One day, while the patient was quietly conversing with her friends, she was suddenly seized with a slight convulsive movement, and immediately expired. On dissection, not only the *psoas* and the *iliacus internus*, but also the *quadratus lumborum*, were found in a state of disorganization. There were two abscesses—the one iliac, and the other dorso-lumbar—which communicated with each other, through the *quadratus* muscle, and the anterior and middle layers of the *transversalis*. Of enormous dimensions, it was one of those purulent sacs "en forme de bouton de chemise," which M. *Velpeau* has so accurately described. The muscular debris was infiltrated with purulent matter.

In the case of M. Vigla, reported in the Bulletin of the Anatomical Society, the *psoas*, *iliacus internus* and *quadratus muscles* were reduced, in a great measure, to a green-coloured pulp. The sub-aponeurotic space communicated with the cavity of the cæcum by an opening through the *fascia iliaca*. There existed, at the same time, a small collection of pus in the folds of the broad ligament on the right side. The abscess extended down to the crural arch, and upwards as high as the attachments of the diaphragm. The filaments of the lumbar plexus, which were ramified on the surface, or between the superficial fibres, of the muscles, were of a dull white colour, and so soft that they were torn across with the greatest ease.

In one of the cases—described in the interesting memoir by MM. Husson and Dance, *sur quelques engorgemens inflammatoires qui se developpent dans la fosse iliaque droite*—the abscess burst through an aperture in the cervix uteri. The abscess occupied the entire extent of the iliac fossa, extending upwards to the kidney and down to the broad ligaments of the womb; the psoas and iliac muscles were dissected, so to speak, by the suppurative process, and traversed by various nervous twigs from the lumbar plexus. As, the morbid action in this case commenced (it was believed) in the uterine ligaments, we cannot regard it as a genuine example of primary *subaponeurotic* abscess within the pelvis.

Besides the Suppurative Lesions which we have already considered, there is another which sometimes occurs in the puerperal state, and therefore deserves to be noticed here. In women recently delivered, the sacro-iliac symphysis sometimes becomes the seat of a purulent inflammation. The chief seat of the pain is over the point of junction of the two bones; and pressure at this part usually occasions severe suffering. "But," says our author, "the most distinctive symptom of this disease is the intolerable pain experienced when pressure is made by the finger, introduced up the vagina, in the direction of the inflamed joint: at all the other points of the vaginal circumference, pressure occasions little or no inconvenience." The patient is usually unable to walk, or even to move herself in bed, without difficulty and pain; and, ere long, the sciatic nerves are very generally involved in the morbid action, giving rise to severe neuralgic suffering along the entire course of the affected limb. *Mauriceau* has related a case, in which, after a painful and protracted labour, there was in the first instance an inflammation of the uterus, and subsequently the formation of "an

immense abscess, which occupied both hips: after two months of suffering, the patient was completely cured."

Before proceeding to examine the other forms of intra-pelvic Abscess—those, namely, which occur in the female quite unconnected with pregnancy, and also in the male subject—we shall briefly notice a few particulars, touching the history of the puerperal lesions which we have been hitherto considering, and first, as to—

The Symptoms of their Invasion.—The earliest symptom that is usually observed is shivering; in some cases there is only one severe fit of this; while in others the fit is frequently repeated. At the same time, the lochial discharge generally becomes much diminished or even entirely stopped, and the mammæ subside very considerably. There is always greater or less disturbance of the bowels; they are either much confined, or affected with diarrhœa. Often there is a great difficulty in micturition, and in defæcation. The movements of the hip and loins are in most cases considerably embarrassed: the corresponding lower extremity often becomes swollen and œdematous, as well as retracted or drawn up towards the body. The local symptoms will necessarily vary much according to the size of the existing swelling, its exact situation, the state of the adjacent tissues, and so forth. The judicious practitioner will never be satisfied with a mere examination of the outward parts in such cases; he will make a point of ascertaining the condition of the pelvic viscera both by the rectum and the vagina. By pressing on the abdomen with the one hand, while the forefinger of the other hand is in either of these passages, much useful information may often be acquired. The size of the tumour, when situated in the iliac region, may vary from that of a small orange to that of an infant's head or upwards. It may extend up to, or even above, the umbilicus, and round to the loin; or it may stretch down into the cavity of the pelvis, part being above and part below its brim.

Diagnosis.—The existence of the pelvic affection is sometimes entirely overlooked. In one of our author's cases, the physician pronounced his patient to be labouring under Phthisis, and never ascertained that there was a swelling in the groin; although the woman, who had been recently confined, complained of pain there. In another case, the disease was pronounced to be mere Neuralgia.

Again, when the presence of the pelvic tumour is known, its real nature may be quite mistaken. Thus we have known a surgeon declare an intra-pelvic abscess—which protruded at the side of the vulva—to be a cancerous growth. On the other hand, the mere accumulation of fæcal matters in some portion of the large intestine has given rise to all the usual symptoms of a purulent collection in the pelvis.

Lastly, when the existence of a fluid collection has been ascertained to be present, there may be considerable ambiguity as to its exact seat. If the contents of the swelling are great, amounting perhaps to five or six pints—as occurred in more than one of our author's cases—the medical attendant may find very considerable difficulty in deciding whether the disease be an effusion within or outside of the peritoneum, or whether it be a diffused abscess in the cellular tissue of the abdominal parietes. Professor *Marjolin* related to us, some time ago, a case where a purulent

collection between the peritoneum and the abdominal muscles extended over nearly the entire surface of the belly. Under such circumstances, a false diagnosis might very readily be formed, unless the previous history of the case was perfectly well known.

After alluding to some other points in the diagnosis, M. *Marchal* concludes his remarks on this head in these words :—" In short, a woman—one, two, or three weeks after delivery—is suddenly seized with shivering and fever, perhaps without any obvious cause, or it may be after exposure to cold, or irregularity of diet, or fatigue ; she experiences a fixed pain at some one point of the abdomen ; the part becomes swollen, the swelling being at first hard and resisting, and subsequently softer and perhaps fluctuating ; the corresponding thigh becomes more or less embarrassed in its movements. When such symptoms are present, we are almost authorized in predicting that we have to do with a phlegmonous tumour of the pelvis, the consequence of the puerperal state."

Etiology.—That there is a peculiarity of constitution in the body of a female, during the puerperal period, predisposing her to the development of purulent formations in certain parts, is a fact that is recognised by every experienced accoucheur. On this subject, our author remarks to the following effect :—

" The puerperal state is, in a great measure, explained by the condition of the blood in the parturient woman. The process of pregnancy has induced a fibrinous—if we may be allowed the expression—diathesis. The fœtus requires a constant supply of fibrin ; and the female system, in consequence of this demand, acquires a singular tendency to the secretion of this formative element. But unfortunately it is, at the same time, the essential *materiel* of inflammatory action ; and thus it is that the very condition, that gives the maternal system the power of supporting the life of the young being, is the prolific source of various ills and sufferings. * * * * * *

" Thus, although the milk *en nature* is never existent in the blood, and therefore can never be transported or conveyed by *metastasis* to any local seat of inflammatory action, the elements of this secretion may be present in it at any time, just in the same manner as the elements of the fœtus are present in it during the process of fœtal development. Keeping this idea in view, we may be inclined to regard, with more favour than pathological writers in the present day are wont to do, the old theories about ' milky deposits,' ' metastatic collections,' &c. *Petit* has very happily remarked, (Dict. des Scienc. Medic.) that a woman, while suckling, has changed her very mode of existence ; and we need scarcely say, that the recent beautiful researches of MM. *Piorry* and *Andral* have contributed not a little to bring back the attention of pathologists to a consideration of the fluids, as well as of the solids, of the living body."

By far the most frequent exciting cause of puerperal intra-pelvic suppuration is a tedious and difficult labour. Hence the majority of cases occur after a first labour—in consequence, doubtless, of the greater degree of dilatation and contusion to which the generative organs are then successively subjected than in after-deliveries. Most of the patients, therefore, are young women, under 25 years of age. It is not improbable that the abscess is not unfrequently formed in the situation of a *thrombus*, or patch of ecchymoses, induced by the severe injury of the parts during the expulsion of the head of the child.

Some cases of intra-pelvic abscess seem to be connected with the sudden cessation of the Lochia, or of the Milk, induced by exposure to cold, by violent mental emotions, &c. "In several cases," adds our intelligent author, "the patients had left the Maternité within a few days after their delivery—a circumstance that should not be forgotten." Premature exposure is unquestionably a prolific source of disease, not only among puerperal women, but also among young infants, in France.

The induction of these abscesses appears to be sometimes—although certainly rarely—owing to a sudden suspension of the catamenial discharge. *Andral* has related the case of a middle-aged woman, who, while menstruating, fell into a pond of water. From that time she experienced a dull, but constant pain in the hypogastric region, accompanied with occasional vomiting and diarrhœa. She died of pneumonia about eight months after the accident. On dissection, a purulent sac was found between the uterus and rectum. On the left side of this sac, there was another tumour, which appeared to belong to the hypertrophied and degenerated ovary; some purulent matter was found within its substance.

In not a few cases, the cause of the disease is scarcely, if at all, appreciable. We are again indebted to *Andral* for a very instructive and curious case in point. A woman who had been long subject to protracted constipation, was distressed with a pain in the right side of the abdomen, and occasionally also with darting pain along the corresponding limb. Subsequently the chief suffering was on the other side, and was felt most in the left flank; at which part a painful swelling made its appearance, accompanied with a distressing numbness of the corresponding thigh, which was unusually sensitive to the touch. M. *Andral* diagnosticated an affection of the ovary. The symptoms were always easier during the period that the catamenia flowed. They gradually became more alarming; and diarrhœa coming on, the patient died. On dissection, a purulent sac was found at the side of the uterus, and resting upon the rectum, with the cavity of which it communicated by an ulcerated opening. This purulent sac was formed by the expanded end of the Fallopian tube. Behind it was situated a smaller tumour, of the size of a chestnut: it proved to be the ovary. On making an incision into it, some healthy-looking pus flowed out. On the right side the state of things was nearly the very reverse. There was a considerable abscess in the ovary, and not within the Fallopian tube; although the latter was much dilated, and also contained some purulent matter.

Intra-pelvic Abscesses in the Male Subject.

These are sometimes the result of disease in the prostate gland, the vesiculæ seminales, or the urethra. The former organ is much more liable to tuberculous deposits, which are apt to become subsequently suppurated, than is generally imagined. Both M. *Lallemand* and M. *Ricord* have noticed this pathological fact. In some cases the substance of the gland becomes quite melted down, if we may so speak, into purulent matter, and nothing but its investing membrane remains.

A good many cases might be adduced to show that the formation of an abscess within some part of the pelvic basin has been attributable to, or

at least connected with, Orchitis, when the spermatic cord has become severely inflamed.

Ledran has recorded in his Observations de Chirurgie, 1731, a case in which the act of vomiting was followed almost immediately by a sharp pain in the right groin; next day there was swelling and tenderness of the spermatic cord. Three weeks afterwards, a tumour had formed in the iliac region; an indistinct fluctuation was perceptible in it. After a good deal of hesitation, an incision was made into it; and forthwith a quantity of most offensive pus was evacuated. The abscess seemed to extend deep into the pelvis, following the direction of the *vas deferens*. The patient was eventually cured.

M. *Marchal* remarks, in reference to this case, "that the contraction of the abdominal muscles during vomiting powerfully closes the external inguinal ring: hence the immediate compression of the spermatic cord and its consequent inflammation. There are other efforts, besides that of vomiting, liable to produce this effect, as we have recently seen in a case under the care of M. Gerdy."

M. Velpeau, in his *Leçons Orales*, mentions the case of a young medical student, in whom there was a suppurating bubo, the result of inflammation of the testicle. In course of time a large abscess formed in the iliac fossa, and when opened, gave issue to a great quantity of matter. M. *Sedillot*, of the Strasbourg hospital, has recently met with two similar cases, one of which proved fatal in consequence of the supervention of hectic fever. M. *Ricord* has treated no fewer than fifteen cases of the sort: in one of these, death was induced by the dresser having pushed in some lint into the cavity of the abscess with too much force, and wounded the peritoneum.

We have alluded to the occasional occurrence of suppurative inflammation of the *iliacus* and *psoas* muscles in puerperal women. That the same lesion is sometimes met with in the male, is proved by the following cases.

A man, 40 years of age and hitherto healthy, although of a scrofulous constitution, was seized, while lifting a heavy carpet, with a sharp pain in the right loin, extending up towards the shoulder, and downwards in the direction of the small trochanter. This sharp pain was succeeded by an uneasiness in the groin of that side, embarrassing the movements of the corresponding extremity. After two months of suffering in this manner, a swelling formed in the right loin. At this time the bowels were so much confined that they did not act above once in the course of a week. On his admission into the hospital, there was a largish tumour in the iliac fossa. This gradually extended to the groin and upper part of the thigh, so that at length it occupied the entire right flank, and appeared to be continued under the Fallopian ligament. When one hand was placed on the anterior part of the swelling, and the iliac portion was tapped with the other, a very distinct fluctuation was perceptible. An incision being cautiously made through the investing tissues, until the purulent sac was reached, a large quantity of laudable matter flowed out. Upon introducing a female catheter into the wound, some days afterwards, it was found that the abscess extended backwards and outwards in the direction of the outer and posterior part of the thigh. A counter-opening was therefore deemed necessary, in order to secure a free vent for the matter. This was made

a little above and behind the great trochanter: a seton was then passed between the two wounds. The amount of discharge gradually decreased, first from the anterior, and afterwards from the posterior opening; the patient eventually was restored to health.

In the following case, related by M. Fournier, the purulent deposit seems to have been owing to a *Rheumatic Cause*. A middle-aged man, after exposure to wet and cold, became affected with arthritic pains in various parts of the body: they gradually subsided under the use of antiphlogistic remedies. There remained, however, an almost constant heavy pain in the left groin and hip; the movements of the corresponding thigh upon the pelvis being at the same time difficult and uneasy. Subsequently a swelling appeared in this groin. When admitted into the Hôtel Dieu, there was a considerable tumefaction not only in the outer part of the left iliac fossa, and in the upper and inner part of the thigh, but also over the buttock and around the great trochanter. On a careful examination of the parts, *M. Dupuytren* formed the opinion that he had to do with an immense abscess, caused by an acute rheumatic affection: he thought that, if the bones were not already diseased, the tendons and muscular aponeuroses were certainly so. An incision was made at the lowest part of the swelling behind; and a vast quantity of tolerably healthy pus discharged. The wound was closed, before the entire quantity flowed out. In the course of a few days, the matter re-collected, and was again evacuated by a puncture: on this occasion it was sanguinolent and somewhat offensive. Gaseous matter, too, had begun to collect within the sac, and was with difficulty discharged by the wound. About ten days later, a counter-opening was made in the crural region; and some dark-coloured pus, with a quantity of gas, made its escape. Irritative fever came on; and then the patient quickly sank. On *dissection*, two immense purulent sacs were found; one being situated between the *vastus externus* and the back part of the thigh: and the other on the inside of the limb, under the crural vessels, and the deep layer of the *fascia lata*. When the abdomen was opened, a purulent sac was found at the side of the sigmoid flexure: it was full of matter, gas, and detritus. Downwards, the matter readily flowed under the crural arch; and upwards, the swelling extended above the *psoas*, the substance of which, as well as of the *iliacus internus*, was in a great measure destroyed. There was no disease of the vertebræ, or of any of the bones of the pelvis.

We need scarcely say that Intra-pelvic Suppuration may be induced by various diseases and injuries of the urinary passages and the rectum, as well as by gun-shot wounds, severe contusions, surgical operations about the pelvis, and such like causes. But we have neither space nor inclination to pursue this subject at the present time.

Our remaining page we shall devote to a brief notice of those "celebres" (as our author calls them) abscesses, which occasionally form in the right iliac fossa, in connexion with some morbid state of the Cæcum and Vermiform Appendage. This variety of intra-pelvic abscess is much more frequently observed in men than in women. Out of 36 cases, alluded to by our author, not more than four occurred in the female sex. It seems to be more common between the 20th and 30th years of life, than at any other age.

With respect to the occasional or inducing causes of the complaint, we find that, sometimes, it follows an attack of Enteritis or Entero-Colitis; and, at other times, it seems to be the result of excessive constipation, and lodgment of hard, fæculent, and other matters in the cæcum; more especially if drastic medicines have been used for a length of time.

It has been observed more than once in persons who have suffered from *colica pictonum*, and also in those who have been subject to tape-worms. But even in both these cases it is doubtful whether the antecedent maladies, or the violent remedies too often resorted to for their relief, were the immediate cause of the cæcal lesion. The presence of hard undigested substances, as melon-seeds, cherry-stones, and so-forth, has been noticed on several occasions. But, in not a few cases, it will be found difficult to trace the local mischief to any very manifest cause. Very generally, the patient's health has been ailing more or less for a length of time, before any swelling is observed in the iliac region.

An Ilio-Cæcal phlegmon has been mistaken for a tumour formed by the liver, or by the displaced kidney; for an ovarian enlargement; for a ventral hernia; for a mere accumulation of fæcal matters in the *caput cæci*, &c. The latter case mentioned is the one which is most liable to impose upon us. It is well therefore to remember that a stercoral tumour is usually irregular and knobby on the surface, and that the existing dulness on percussion may be removed by dislodging the contents of the gut. Moreover, the formation of the tumour is always preceded by constipation. Whenever there is any ambiguity in the diagnosis, we should administer aperient medicines.

As to the *termination* of the disease, we need scarcely say that, by the adoption of judicious measures in the early stage, the inflammation may often be checked before the suppurative process has commenced. When hiccup and diarrhœa ensue, or symptoms of diffused peritonitis make their appearance, the prognosis is very unfavorable. "In such cases we find on dissection," says our author, "a purulent *foyer* around and behind the cæcum, with destruction of the cellular tissue which surrounds this organ and the commencement of the ascending colon, and of that in the iliac fossa, extending down to the crural arch, or even to the pubes; the affected gut is often much softened."

Sometimes the abscess bursts into the cavity of the cæcum, either spontaneously, or after an effort of vomiting or coughing. If the fistulous opening remains, and the purulent secretion continues, the patient will, in all probability, become hectic and die; but not unfrequently the case terminates favourably; the discharge of pus becoming less and less, until at length it ceases completely. In other cases, the abscess opens into the rectum, or even into the urinary bladder. When it bursts outwardly, the quantity of purulent matter discharged has occasionally been very large: melon-seeds and other foreign substances have been known to be voided at the same time. In one of *Dupuytren's* cases, there were several fistulous openings, which gave vent to pus mixed with gaseous and fæcal matters; pus was discharged with the stools also. The patient ultimately recovered, in spite of this most unfavourable state of things. In a curious case related by *M. Meniere*, the abscess first broke outwardly; the cutaneous wound then healed, and the matter again collecting, it burst suc-

cessively into the cæcum, the urinary bladder, and at length outwardly through the cicatrix in the integuments.

In all cases, the sooner that an outward opening is made with the knife, the better: by giving a free outlet to the matter as it is formed, we shall often succeed in materially lessening, if not in altogether preventing, the lesion of the gut itself.

Vestiges of the Natural History of Creation. Octavo, pp. 390. Churchill, 1844.

This is a remarkable volume—small in compass—but embracing a wide range of inquiry, from worlds beyond the visible starry firmament, to the minutest structures of man and animals. The work is written with peculiar and classical terseness, reminding us very much of the style of Celsus. No name is prefixed—perhaps in order to avoid the snarls of the narrow-minded and bigoted saints of the present day, who will be up in arms against any man who presumes to think that this little globe we tread on, can number more than six thousand years since its first formation.

The first chapter is on the Astral and Solar Systems. The following passage will convey some idea of our author's manner.

"The evidence of the existence of other astral systems besides our own is much more decided than might be expected, when we consider that the nearest of them must needs be placed at a mighty interval beyond our own. The elder Herschel, directing his wonderful tube towards the *sides* of our system, where stars are planted most rarely, and raising the powers of the instrument to the required pitch, was enabled with awe-struck mind to see, suspended in the vast empyrean, astral systems, or, as he called them, firmaments, resembling our own. Like light cloudlets to a certain power of the telescope, they resolved themselves, under a greater power, into stars, though these generally seemed no larger than the finest particles of diamond dust. The general forms of these systems are various; but one at least has been detected as bearing a striking resemblance to the supposed form of our own. The distances are also various, as proved by the different degrees of telescopic power necessary to bring them into view. The farthest observed by the astronomer were estimated by him as thirty-five thousand times more remote than Sirius, supposing its distance to be about twenty thousand millions of miles. It would thus appear, that not only does gravitation keep our earth in its place in the solar system, and the solar system in its place in our astral system, but it also may be presumed to have the mightier duty of preserving a local arrangement between that astral system and an immensity of others, through which the imagination is left to wander on and on without limit or stay, save that which is given by inability to grasp the unbounded." 7.

Coming down to mother Earth, our author seems to think that all matter, constituting the Heavens and the Earth, was originally one mass—and that, previously to stellar and planetary formations, nebulous matter must have been a universal "fire-mist," of an immensely high temperature. A change in this heat must have led to agglomeration, and the various forms which we see around us, in the Solar and Stellar Sys-

terms. The solids, liquids, and gases of our Globe are reducible into fifty-five substances, called Elementary—six gases, forty-two metals, and several without names.

In the nebular hypothesis, satellites are considered as masses thrown off from their primaries, exactly as the primaries had been previously thrown off from the sun.

"The orbit of any satellite is also to be regarded as marking the bounds of the mass of the primary at the time when that satellite was thrown off; its speed likewise denotes the rapidity of the rotatory motion of the primary at that particular juncture. For example, the outermost of the four satellites of Jupiter revolves round his body at the distance of 1,180,582 miles, showing that the planet was once 3,675,501 miles in circumference, instead of being, as now, only 89,170 miles in diameter. This large mass took rather more than sixteen days six hours and a half (the present revolutionary period of the outermost satellite) to rotate on its axis. The innermost satellite must have been formed when the planet was reduced to a circumference of 309,075 miles, and rotated in about forty-two hours and a half." 37.

By the same calculation, the Earth, at a certain time after it was thrown off from the Sun, was no less than 482,000 miles in diameter—being sixty times more than at present. It then required 29½ days to perform its present diurnal rotation. At what period the moon was thrown off from the Earth, it is impossible to form an estimate. It is evident, however, that our satellite is unprovided with an atmosphere—and highly probable that it is incapable of supporting animal life. It does not present any water on its surface; but its mountains and volcanoes are on a stupendous scale. The Moon may be in progress to a formation that will exhibit seas and atmosphere, when it will present organic life like the Earth.

"We have seen reason to conclude that the primary condition of matter was that of a diffused mass, in which the component molecules were probably kept apart through the efficacy of heat; that portions of this agglomerated into suns, which threw off planets; that these planets were at first very much diffused, but gradually contracted by cooling to their present dimensions. Now, as to our own globe, there is a remarkable proof of its having been in a fluid state at the time when it was finally solidifying, in the fact of its being bulged at the equator, the very form which a soft revolving body takes, and must inevitably take, under the influence of centrifugal force. This bulging makes the equatorial exceed the polar diameter as 230 to 229, which has been demonstrated to be precisely the departure from a correct sphere which might be predicated from a knowledge of the amount of the mass and the rate of rotation." 41.

The *internal* heat of the earth supports the above theory, as evinced by volcanos, thermal springs, &c.

Era of the Primary Rocks.—Dissections have gone far enough to show that the basis rock of this globe is of a hard texture and crystalline constitution, of which granite may be considered the type. Over this, except in some mountainous projections, other rocks are disposed in strata, apparently deposited from water, but broken and disturbed by uneasy movements from beneath. Through these clefts may be, here and there, seen projections of rock of the primæval species—basalt—which had evidently been in a molten state at the time of eruption. The deposition of the aqueous, and the projection of the volcanic rocks have evidently taken place since the settlement of the Earth in its present form, and its agglo-

meration from the nebulous or vaporiform state. Such rocks unquestionably evince a combination of two or more of silica, mica, quartz, and hornblende, each of which is composed of a group of simple or elementary substances.

The deposition of Secondary Rocks or strata, is a process which is easily understood, being, in fact, still going on before our eyes, though on a comparatively small scale. In those days the seas were, in some places, more than a hundred miles in depth—and the submarine mountains of tremendous altitudes. The system of disintegration, under such circumstances, must have been enormous. The matters worn off, being carried into the neighbouring depths, and there deposited, became the components of the earliest stratified rocks—the first series of which (gneis and mica slate system) were of prodigious thickness—even one hundred miles! The seas, at that epoch, were probably of a boiling temperature. These early strata contain nothing but what are found in the primæval granite. They are the same in materials, but only changed in form. They exhibit no traces of vegetable or animal remains, that tell the wondrous tales of past history, in subsequent strata!

Commencement of Organic Life.—Here a new feature takes place in the stratified rocks—limestone—the carbonic acid gas of which plays such a part in animal and vegetable existence. Here, then, is an indication that vegetable and animal life began to appear—the carbonic acid gas being then, probably, too great in the atmosphere to support the life of land animals. And what are the organic remains discovered in this early stratum of earth? The unpretending forms of various Zoophites and Polypes, together with a few single and double-valved shell-fish—all of them creatures of the sea. Of vegetable remains none have come down to us of this period—perhaps they were too fragile to stand the wear and tear of the long journey.

Ascending to the next group of rocks—the Silurian—we find the traces of life become more abundant—the number of species extended—and important additions made in certain vestiges of fuci, or sea-plants, and fishes. From the lowest beds upwards, there are polypiarii, conchiferi, terebratula, mollusca, trilobate crustacea, &c.

Red Sandstone.—We now advance to a new Chapter in this wonderful history. This term has been applied to a series of strata, of enormous thickness, a mixture of flagstones, marly rocks, sandstones, in which is found bitumen, a remarkable new ingredient, being a vegetable production. Here we have the same forms of life continued, with the addition of fishes, some of which are of most extraordinary form, and showing that the seas, in which the old red sandstone was deposited, must have swarmed with fishes. We can only notice one kind.

"The *pterichthys* has also strong bony plates over its body, arranged much like those of a tortoise, and has a long tail; but its most remarkable feature, and that which has suggested its name, is a pair of long and narrow wing-like appendages attached to the shoulders, which the creature is supposed to have erected for its defence when attacked by an enemy." 70.

Many of the fishes of that remote period were, in general outline, similar to fishes now existing, but they exhibited striking peculiarities in their internal organization. As yet there were no land animals—perhaps no dry land. The strata must have been first horizontal—and ultimately the granitic points must have been protruded above the level of the sea, forming our mountains—and that, most probably, by the action of volcanic fire.

"It may be called the *Era of the Oldest Mountains*, or, more boldly, of the formation of the detached portions of dry land over the hitherto watery surface of the globe—an important part of the designs of Providence, for which the time was now apparently come. It may be remarked, that volcanic disturbances and protrusions of trap took place throughout the whole period of the deposition of the primary rocks; but they were upon a comparatively limited scale, and probably all took place under water. It was only now that the central granitic masses of the great mountain ranges were thrown up, carrying up with them broken edges of the primary strata; a process which seems to have had this difference from the other, that it was the effect of a more tremendous force exerted at a lower depth in the earth, and generally acting in lines pervading a considerable portion of the earth's surface." 74.

Land formed.—This brings us to another great era in the history of our globe. Land was laid bare—rains came down, and formed into springs, rivers, and lakes. The secondary, or stratified rocks, consisting of a great and varied series, rest generally against the flanks of the upturned primary rocks—sometimes considerably inclined—at others, forming basin-like beds, nearly horizontal—in many places broken up and shifted by disturbances from below. There was now a theatre for the existence of land-plants and animals. In the lowest group of secondary rocks was the carboniferous or coal strata, of vegetable formation, and presenting numerous species and kinds of plants, many of which are now without descendants. The animal remains of this era are not numerous, in comparison with those which go before or succeed. Some of the fishes are of the sauroid character, partaking of the lizard nature, a genus of the Reptilia or land-class. Here, therefore, we have an approach to the air-breathing animals.

"Coal strata are nearly confined to the group termed the carboniferous formation. Thin beds are not unknown afterwards, but they occur only as a rare exception. It is therefore thought that the most important of the conditions which allowed of so abundant a terrestrial vegetation, had ceased about the time when this formation was closed. The high temperature was not one of the conditions which terminated, for there are evidences of it afterwards; but probably the superabundance of carbonic acid gas supposed to have existed during this era was expended before its close. There can be little doubt that the infusion of a large dose of this gas into the atmosphere at the present day would be attended by precisely the same circumstances as in the time of the carboniferous formation. Land animal life would not have a place on earth; vegetation would be enormous; and coal strata would be formed from the vast accumulations of woody matter, which would gather in every sea, near the mouths of great rivers." 91.

The termination of the carboniferous formation is marked by symptoms of volcanic violence—which some geologists have considered as the close of one system of things, and the beginning of another. Coal-beds gene-

rally lie in basins—but all such basins are broken up into pieces, some of which are tossed up on edge—others sunk, while numerous eruptions of volcanic rock (trap) are seen.

Terrestrial Zoology.—The new red sandstone presents the commencement of land animals, and is subdivided into several groups.

"The second group is a limestone with an infusion of magnesia. It is developed less generally than some others, but occurs conspicuously in England and Germany. Its place, above the red sandstone, shows the recurrence of circumstances favourable to animal life, and we accordingly find in it not only zoophytes, conchifera, and a few tribes of fish, but some faint traces of land plants, and a new and startling appearance—a reptile of saurian (lizard) character, analogous to the now existing family called monitors. Remains of this creature are found in cupriferous (copper-bearing) slate connected with the mountain limestone, at Mansfield and Glucksbrunn, in Germany, which may be taken as evidence that dry land existed in that age near those places." 95.

Various fishes of that era disappear entirely. The third group, chiefly sandstones, show great agitation, and consequent diminution of animal life; but present, for the first time, specimens of vertebrate animals of the sub-kingdom, namely, reptiles with imperfect respiratory apparatus. The specimens found are allied to the crocodile and lizard tribes of the present day—but stupendous in size.

The animal to which the name *ichthyosaurus* has been given, was as long as a young whale, and it was fitted for living in the water, though breathing the atmosphere. It had the vertebral column and general bodily form of a fish, but to that were added the head and breast-bone of a lizard, and the paddles of the whale tribes. The beak, moreover, was that of a porpoise, and the teeth were those of a crocodile. It must have been a most destructive creature to the fish of those early seas." 97.

The pterodactyle was a lizard, furnished with wings to pursue its prey in the air. Crocodiles were 100 feet in length! Marks of the feet of animals are discovered in the slabs of the new red sandstone. Some of these prints indicate small animals; but others denote birds of unusually large size.

Oolite—Mammalia.—The oolite is a limestone composed of small round grains, like eggs, or rather the roe of a fish. It is largely developed in England, France, and other countries, and is supposed to be of chemical formation. Organic remains are very numerous in the oolite system. The animals of the oolite are entirely different in species from those of the preceding age. The dry land of this period presented cycadeæ, a beautiful class of plants between the palms and conifers. The ocean at this time swelled with inhabitants. The polypiaria were so abundant as to form strata of themselves. Here was the BELEMNITE, with conical shell, air-chambers, and an ink-bag, with which it could muddle the water around it when pursued! Land reptiles now abounded, and here, for the first time, we find remains of insects—also some fragments of the marsupial family, now the kangaroo.

Cretaceous Formation.—This, being a marine deposit, shows that the

sea once flowed over the Cliffs of Dover, but the organic remains found in the chalk-beds, prove that dry land must have existed in the neighbourhood.

Tertiary Formation—Mammalia.—The chalk-beds are the highest strata that extend over a considerable space; but in hollows of these beds there have been formed series of strata—clays, limestones, marls, &c. to which the name of *tertiary formation* has been given.

"The hollows filled by the tertiary formation must be considered as the beds of estuaries left at the conclusion of the cretaceous period. We have seen that an estuary, either by the drifting up of its mouth, or a change of level in that quarter, may be supposed to have become an inland sheet of water, and that, by another change, of the reverse kind, it may be supposed to have become an estuary again. Such changes the Paris basin appears to have undergone oftener than once, for, first, we have there a fresh-water formation of clay and limestone beds; then a marine-limestone formation; next, a second fresh-water formation, in which the material of the celebrated *plaster of Paris* (gypsum) is included; then, a second marine formation of sandy and limy beds; and finally, a third series of fresh-water strata. Such alternations occur in other examples of the tertiary formation likewise." 126.

Shells innumerable have been found in these tertiary deposits; but they sink into insignificance when compared with the mammalian remains discovered in the Parisian beds, and which prove that the land had now become the theatre of an extensive creation of the highest class of animals. Cuvier ascertained fifty species of these—all of them long since extinct. One was about the size of a horse, with lower jaw shorter than the upper—the feet presenting three large toes unprovided with claws. All these animals were herbivorous. One of them was 18 feet in length—had a mole-like form, capable of digging in the earth, and, as Dr. Buckland thinks, adapted both for land and water. In a subsequent period of the tertiary formation, the above animals disappear, and we have the elephant, hippopotamus, rhinoceros, &c. some of them startling from their size, as the mastodon twelve feet in height! The pliocene period of the tertiary deposits gives us the ox, the deer, camels, and other species of the *ruminantia*. Evidences of great volcanic disturbances are distinguishable in the tertiary deposits.

Superficial Formations.—Between the tertiary period, above alluded to, and the formation of man, there appears to have been an era of stiff blue clay, mingled with fragments of rock, of all sizes, travel-worn, to which geologists have given the name of *diluvium*, as being apparently the produce of some vast *flood*, or of the sea thrown into an unusual agitation. It seems then, when this stratum was laid down, much of the present dry land was under the ocean.

"The included masses of rock have been carefully inspected in many places, and traced to particular parent beds at considerable distances. Connected with these phenomena are certain rock surfaces on the slopes of hills and elsewhere, which exhibit groovings and scratchings, such as we might suppose would be produced by a quantity of loose blocks hurried along over them by a flood." 135.

This diluvium and these erratic blocks clearly indicate one last and long

submersion of this globe's surface under the ocean.* But at length the land rose, or the sea subsided, as evidenced by the *terraces* which were successively the shores of the sea, and which are still seen, one above the other, on various coasts. They rise from twenty to twelve hundred feet above the level of the ocean.

The irresistible inference from the phenomena is, that the highest was first the coast line ; then an elevation took place, and the second highest became so, the first being now raised into the air and thrown inland. Then, upon another elevation, the sea began to form, at its new point of contact with the land, the third, highest beach, and so on down to the platform nearest to the present sea-beach." 141.

This general submersion must, in all probability, have destroyed all terrestrial animal life ; for no animals of anterior periods could be detected subsequently. The whole was changed—and a new creation took place when land re-appeared!

"Thus concludes the wondrous chapter of the earth's history which is told by geology. It takes up our globe at the period when its original incandescent state had nearly ceased; conducts it through what we have every reason to believe were vast, or at least very considerable, spaces of time, in the course of which many superficial changes took place, and vegetable and animal life was gradually developed ; and drops it just at the point when man was apparently about to enter on the scene." 145.

Here our ingenious author enters into a long discussion as to whether the various tribes of animals were created and recreated by the direct personal power of the Almighty, or by the agency of *laws* which he laid down from the beginning. We do not see much interest in this dissertation ; for either supposition infers the existence, the power, and the wisdom of the Creator.

"Those who would object to the hypothesis of a creation by the intervention of law, do not perhaps consider how powerful an argument in favour of the existence of God is lost by rejecting this doctrine. When all is seen to be the result of law, the idea of an Almighty Author becomes irresistible, for the creation of a law for an endless series of phenomena—an act of intelligence above all else that we can conceive—could have no other imaginable source, and tells, moreover, as powerfully for a sustaining as for an originating power." 158.

Man.—We have seen that, as soon as the temperature of the once boiling sea had settled down to a certain point, the ocean became tenanted by various kinds of animals, as evinced by their remains being found embedded in the strata formed beneath the waters. And when the land projected above the level of the ocean, and became tenantable, life was instantly produced, and series after series of animated creatures spread themselves over its surface. For how many millions and millions of years this production and reproductions of animals went on before man made his appearance on the scene, no human being will ever know. In all probability, countless ages must have elapsed, before this master-piece of creation appeared. Our author's speculations on the how, the why, the

* The Barham rocks near Harrogate present remarkable specimens of the above.—*Rev.*

when and the wherefore this great event occurred, will not give satisfaction to the present race of mankind! His hypothesis is three or four centuries in advance of the TIMES, and will be stigmatized by the modern saints as downright Atheism, although the author every where expresses his reverence for the consummate wisdom and power, and benevolence of the Supreme Being.

Our author evidently leans to the doctrine of "equivocal generation," considering the giving life to insects out of flint by Mr. Cross, as much a law of the Almighty, as the creation of the elephant or the homo.

"On the hypothesis here brought forward, the *acarus Crossii* was a type of being ordained from the beginning, and destined to be realized under certain physical conditions. When a human hand brought these conditions into the proper arrangement, it did an act akin to hundreds of familiar ones which we execute every day, and which are followed by natural results; but it did nothing more. The production of the insect, if it did take place as assumed, was as clearly an act of the Almighty himself, as if he had fashioned it with hands." 189.

Our author seems convinced that, instead of new creations at various epochs of the revolutions of this globe, one race reproduced its successor, according to the original laws of the Deity, and not by immediate interposition of God himself. This is the portion of his doctrine which will have to stand a hard test by the saints of the day!

"We have yet to advert to the most interesting class of facts connected with the laws of organic development. It is only in recent times that physiologists have observed that each animal passes, in the course of its germinal history, through a series of changes resembling the *permanent forms* of the various orders of animals inferior to it in the scale. Thus, for instance, an insect standing at the head of the articulated animals, is, in the larva state, a true annelid, or worm, the annelida being the lowest in the same class. The embryo of a crab resembles the perfect animal of the inferior order myriapoda, and passes through all the forms of transition which characterize the intermediate tribes of crustacea. The frog, for some time after its birth, is a fish with external gills, and other organs fitting it for an aquatic life, all of which are changed as it advances to maturity, and becomes a land animal. The mammifer only passes through still more stages according to its higher place in the scale. Nor is man himself exempt from this law. His first form is that which is permanent in the animalcule. His organization gradually passes through conditions generally resembling a fish, a reptile, a bird, and the lower mammalia, before it attains its specific maturity. At one of the last stages of his fœtal career, he exhibits an intermaxillary bone, which is characteristic of the perfect ape: this is suppressed, and he may then be said to take leave of the simial type, and become a true human creature. Even, as we shall see, the varieties of his race are represented in the progressive development of an individual of the highest, before we see the adult Caucasian, the highest point yet attained in the animal scale." 199.

To come to particulars. The brain of man exceeds that of all other animals in complexity of organization and fulness of development. Yet, at one early period, it is only "a simple fold of nervous matter," with difficulty distinguishable into three parts. In this state it perfectly resembles the brain of an adult fish—thus assuming, *in transitu*, the form that, in the fish, is permanent.

"In a short time, however, the structure is become more complex, the parts more distinct, the spinal marrow better marked; it is now the brain of a reptile.

The change continues; by a singular motion, certain parts (*corpora quadragemina*) which had hitherto appeared on the upper surface, now pass towards the lower; the former is their permanent situation in fishes and reptiles, the latter in birds and mammalia. This is another advance in the scale, but more remains yet to be done. The complication of the organ increases; cavities termed *ventricles* are formed, which do not exist in fishes, reptiles, or birds; curiously organized parts, such as the corpora striata, are added; it is now the brain of the mammalia. Its last and final change alone seems wanting, that which shall render it the brain of MAN. And this change in time takes place.

"So also with the heart. This organ, in the mammalia, consists of four cavities, but in the reptiles of only three, and in fishes of two only, while in the articulated animals it is merely a prolonged tube. Now in the mammal fœtus, at a certain early stage, the organ has the form of a prolonged tube; and a human being may be said to have then the heart of an insect. Subsequently it is shortened and widened, and becomes divided by a contraction into two parts, a ventricle and an auricle; it is now the heart of a fish. A subdivision of the auricle afterwards makes a triple-chambered form, as in the heart of the reptile tribes; lastly, the ventricle being also subdivided, it becomes a full mammal heart." 201.

The tendency says our author, of all these illustrations is to make us look to *development* as the principle which has been immediately concerned in the peopling of this Globe. We confess that, to us it appears more philosophical to consider the first pair of each species of animated beings—man himself included—to have been created by the express command of GOD, and the races—to have been perpetuated afterwards by the laws which we see daily operating before our eyes. Nor do we think that this view of the matter is at all deteriorated by the circumstance of its being consonant with Scripture. As for new kinds of creatures having been added from time to time, to the old stock, or brought on the stage as their successors, we consider them just as much original creations as their predecessors.

Our author seems to think it not impossible—perhaps not improbable—that man himself may, in some mysterious manner, *develop* his physical and mental powers so as to produce a race as much superior to the present, as the present is to the beast of the field. From six to ten thousand years' experience of mankind does not give much sanction to this hope—for we fear that human nature, at the present day, is not a whit better than it was before the Flood.

After the masterly history of the human race by Dr. Pritchard, we need not enter on our author's views of this matter. He considers all the different races of mankind as sprung from one parent family.

Our author's opinions respecting the *mental distinctions* between man and animals may be easily gathered from the following passage.

"There is a general disinclination to regard mind in connexion with organization, from a fear that this must needs interfere with the cherished religious doctrine of the spirit of man, and lower him to the level of the brutes. A distinction is therefore drawn between our mental manifestations and those of the lower animals, the latter being comprehended under the term instinct, while ours are collectively described as mind, mind being again a received synonyme with soul, the immortal part of man. There is here a strange system of confusion and error, which it is most imprudent to regard as essential to religion, since candid investigations of nature tend to show its untenableness. There is, in

reality, nothing to prevent our regarding man as specially endowed with an immortal spirit, at the same time that his ordinary mental manifestations are looked upon as simple phenomena resulting from organization, those of the lower animals being phenomena absolutely the same in character, though developed within much narrower limits." 326.

In a chapter on the "Purpose and General Condition of the Animal Creation," we find many ingenious remarks, as well as important reflections, moral and religious. That *enjoyment* is the proper attendant of animal existence is proved by all observation and experience. But to form so vast a range of being, and to make it everywhere a source of gratification, seems beyond the power—or at all events the will of the Creator!

"It appears at first difficult to reconcile with this idea the many miseries which we see all sentient beings, ourselves included, occasionally enduring. How, the sage has asked in every age, should a Being so transcendentally kind, have allowed of so large an admixture of evil in the condition of his creatures? Do we not at length find an answer to a certain extent satisfactory, in the view which has now been given of the constitution of nature? We there see the Deity operating in the most august of his works by fixed laws, an arrangement which, it is clear, only admits of the main and primary results being good, but disregards exceptions.

Thus the winds, so useful to living creatures, will rise into hurricanes, destructive of animal and vegetable life. The love of exercise will sometimes lead to injuries that render individuals cripples for life. Even war, the most tremendous of evils, is caused by certain tendencies of human nature, as tenacity of supposed rights—resentment of injuries—desire of admiration—combativeness—love of excitement—ambition, and many other passions that are, within limits, indisputable benefits to us; but which, when carried beyond legitimate boundaries, inflict on us, terrific sufferings! God has given us these tendencies for good purposes; but has not laid down any absolute obstruction to our misuse of them. He has, however, given us REASON to restrain our passions—and Religion to direct our steps in the paths of virtue. Still, there are evils for which we see no evident reason, and which the good and the bad experience alike.

"It is clear, moreover, from the whole scope of the natural laws, that the individual, as far as the present sphere of being is concerned, is to the Author of Nature a consideration of inferior moment. Everywhere we see the arrangements for the species perfect; the individual is left, as it were, to take his chance amidst the *mêlée* of the various laws affecting him. If he be found inferiorly endowed, or ill befals him, there was at least no partiality against him. The system has the fairness of a lottery, in which every one has the like chance of drawing the prize.

"Yet it is also to be observed, that few evils are altogether unmixed. God, contemplating apparently the unbending action of his great laws, has established others which appear to be designed to have a compensating, a repairing, and a consoling effect. Suppose, for instance, that from a defect in the power of development in a mother, her offspring is ushered into the world destitute of some of the most useful members, or blind, or deaf, or of imperfect intellect, there is ever to be found in the parents and other relatives, and in the surrounding public, a sympathy with the sufferer, which tends to make up for the deficiency, so that he is in the long run not much a loser. Indeed, the benevolence implanted in our nature seems to be an arrangement having for one of its principal objects to cause us, by sympathy and active aid, to remedy the evils unavoidably suffered

by our fellow-creatures in the course of the operation of the other natural laws. And even in the sufferer himself, it is often found that a defect in one point is made up for by an extra power in another. The blind come to have a sense of touch much more acute than those who see. Persons born without hands have been known to acquire a power of using their feet for a number of the principal offices usually served by that member. I need hardly say how remarkably fatuity is compensated by the more than usual regard paid to the children born with it by their parents, and the zeal which others usually feel to protect and succour such persons. In short, we never see evil of any kind take place were there is not some remedy or compensating principle ready to interfere for its alleviation. And there can be no doubt that in this manner suffering of all kinds is very much relieved." 379.

We have dedicated a space to this remarkable work that may induce many of our readers to peruse the original. The author is, decidedly, a man of great information and reflection. He will have a host of saints in array against him, and many will join in the cry, from hypocrisy and self-interest. As we said before, his doctrines have come out a century before their time.

FACTS AND OBSERVATIONS IN MEDICINE AND SURGERY. By *John Grantham*. Octavo, pp. 216. Churchill, 1844.

THE Facts and observations contained in this work have appeared from time to time in the Medical Gazette, and we question the author's policy in transferring them from the small type and double column of our cotemporary to the present broad-margined smart-looking volume. Passing muster very well amidst the miscellaneous matters of a periodical, collected apart, contributions of this sort are so often disappointing as to be seldom read, unless when known to be the productions of esteemed writers. We fear this work will prove no exception to the general rule; for although several of the facts are interesting, they are not numerous or important enough to constitute a substantive volume, while many of the author's observations upon disease are vague and verbose, and some of the extracts with which he has interlarded them, of undue length and insufficient bearing.

We will now refer to those passages we consider most interesting.

Treatment of Fractures by Suspension.—Mr. Grantham considers the advantages attending the treatment of fractures of the lower extremity by suspension have not been duly appreciated in this country. He translates a paper by Mayor of Geneva, detailing some of these, and corroborates the conclusions arrived at by the results of his own practice. The limb, inclosed in splints as usual, is not allowed to lie upon the bed, impeding every movement of the patient, and becoming deranged in the apposition of its fractured parts, or otherwise injured, whenever the posture is changed. Protected by a pad, it is laid upon a wooden frame, and the whole suspended by ropes extending from the ceiling or upper part of the

bed underneath the apparatus. So adjusted, the movements of the patient are much less restrained; for, in ordinary cases, he may sit out of bed daily, and in the case of bad compound fractures, quietude of the parts is often obtained to the extent of allowing the patient refreshing sleep; and indeed, many limbs, which under ordinary treatment would have been condemned to amputation, are preserved to the patient. Union, too, takes place with great rapidity, while less callus than ordinary is deposited. Dr. Wigan is quoted as having observed the excellent effects of this practice; he says:—

"I saw it employed in many cases at Lausanne, and was the means of introducing it into some parts of Italy and France; but although I had often seen patients get in and out of bed without any assistance, and without risk of disturbing the limb, and spared no asseverations to convince, it was rare that I could get any one to comprehend fully the extreme simplicity and perfection of the apparatus, and I was often unsuccessful. I have observed all over Europe, that surgeons are miserable mechanics, and have seen many apparatus by common bone-setters, Greeks, Germans, and Dutch, which would shame our hospital surgeons.

"In passing from Lausanne into Italy, I found a lady at a miserable cottage in the High Alps, who had been six weeks on the floor, having broken her leg by the fall of a mule, in passing over the Wengern Alp. Serious injury was coming on in various parts of the body, from confinement to one position. On the application of the new apparatus, she was immediately able to rise: her gratitude was unbounded, and her recovery so rapid, that a few weeks afterwards I encountered her at Milan, quite restored.

"Dr Mayor never claimed the merit of the invention, but he made great efforts to teach the peasantry of the mountains the use of the apparatus, which was within the means of any one to construct—a matter of importance in their insulated life, where they could not procure surgical aid at any price for five or six months together.

"The mode of fastening which I saw in Switzerland, was rather clumsy and complicated. I substituted the *guy*, which I think is an improvement." 35.

The author relates but three of the cases to which he has applied this plan of treatment, but there can be no doubt it is deserving of far more notice in our large hospitals than it has hitherto received. The following is one of the cases.

"Copley, a bricklayer's labourer, bearing a hod of bricks on his shoulder, fell from a scaffold ten feet from the ground. He dislocated the ankle-joint inwards, and fractured the fibula at about three inches above its lower end. On the following day, I placed the limb on the suspension apparatus. The patient was assisted out of bed, and sat in a chair, with the fractured limb suspended by a cord attached to the ceiling. It is now the 25th day: ossific union has taken place: there is no tenderness of the joint, neither has he suffered severe pain, although there was much tumefaction and extravasation. He has not been confined to the bed one whole day since the accident occurred."

Local Applications to Fractured and Contused Limbs.—Mr. Grantham objects strongly to the employment of cold applications, not only in the case of fractures, but in all injuries producing inflammatory action in the cartilaginous, fibrous, and muscular structures.

"It is now eight years since I first advocated the necessity of attending to and

keeping up the action and temperature of the cutaneous structures in inflammation, laceration, or contusion of the cartilaginous, ligamentous, tendinous, fibrous, and muscular structures of the body, and also since I denounced in those injuries the application of cold, and the diminution of power by means of local bleeding near the wounded part. Experience has fully attested the many advantages of hot, stimulating applications: they have a decided pre-eminence over all others in lessening the sufferings of the patient; while, on the other hand, much time is gained in restoring the reparative action of the parts, notwithstanding the tumefaction, redness, and swelling of the cutaneous and subcutaneous structures generally proceed with great activity during the first four days, then gradually subside about the seventh or eighth day, leaving the deep-seated structures comparatively free from pain either on motion or pressure; and the truth of this will appear evident in reflecting upon the well-known Hunterian law, that no two inflammations can exist with equal force in the same system, the one will mitigate the other. Next, we must consider the lowly-organized state of these structures, which are only balanced or supported in their normal action or temperature by the power of the exhalent vessels of the skin. Did these lower structures contain but one drachm of blood more than in their normal condition, the result would be inflammation, which would require at least three months to effect a termination by resolution. It is a fact that excitement of the arteries in the vicinity of an injury assists much in the restoration of a sanative action. Only diminish the power of the arteries and exhalents below the natural standard in such injuries, and you deprive the limb of the means of repairing the mischief, and too frequently bring on phlegmonous inflammation or sphacelus. By this statement I do not mean to condemn the necessity of general depletion when the pulse is quick and hard; but I feel bold in asserting, that local bleeding by leeches, with the application of cold lotions, prevents the well-doing of such cases." 68.

Two cases are related, one of dislocation of the lip, and the other of the elbow: the pain, tumefaction, and tenderness remaining after reduction in the former were dissipated by hot fomentations and mustard poultices, in the latter, by hot fomentations and stimulating embrocations. The author seems to us to resort too frequently to general bleeding in fracture as a *preventive* of inflammation. We would recommend some observations quoted from Mr. Travers in our present number to his notice.

The Double-inclined Plane.—" I beg leave to state my objection to the straight position in the treatment of fracture of the thigh and leg. From the commencement of my surgical life I have been in the habit of placing fractured limbs in such a position that the fewest muscles are rendered tense. In fractures of the thigh, notwithstanding the apparent simplicity and adaptability of Dessault's splint, I am practically convinced that the patient who is treated in such a manner loses much time during the convalescent stage. The bone may unite, the limb may be rendered straight by its application, but on a fair comparison with a proper double-inclined plane, rightly adjusted, [the author represents in a wood-cut the form of this he employs,] the patient will suffer far less pain in getting the limb accommodated to that passive form, than by the extended position. Two things, therefore, are gained—a shorter duration of pain, and many weeks of time in the restoration of the muscular action during the convalescent stage of a fracture." 72.

Extensive Burn.—A case of a burn from gunpowder is related, in which nearly the whole of the trunk and a portion of the extremities were involved, "the whole measured above 600 superficial inches, or four feet,

24 inches, and averaged a quarter of an inch in depth. Also the subcutaneous structure was completely lost, so that the arteries and veins were seen, as if neatly dissected, lying on the surface of the muscles and fascia." The successful issue of the case reflects great credit upon the author, especially as more than one untoward occurrence intervened. Three principles especially guided him, the due supply of nutritive food, the regulation of the animal heat, and the external and internal use of antiseptic agents, such as the application of yeast, the evolution of oxymuriatic gas into the apartment, the administration of alkalis, &c. During the extensive suppuration which occurred, six pints of milk in the twenty-four hours served to support the youth's (æt. 17) strength. A sphacelated wound over the sacrum, an attack of bronchitis, and an extensive re-opening of the wound by erysipelas, successively retarded the cure, and long rendered recovery apparently hopeless. It required several years to produce entire healing, during and subsequently to which there has been much tendency to congestion of the brain, requiring small depletions and aperients, and attributable to the imperfect re-establishment of the functions of the skin over so large a surface.

Insanity.—Mr. Grantham has two chapters upon the premonitory symptoms and treatment of insanity. He says :—

" The duties of the general practitioner in cases of insanity, are chiefly limited to the treatment of the premonitory symptoms : it is at that time when the patient stands, as it were, on neutral ground, that the practitioner is sent for ; at a time when he is surrounded by relatives and friends, and the soothing attentions of home—circumstances often the most favourable for the sufferer. But with these advantages, a very frequent cause of error in the judgment of a medical man (when called upon to decide as to the state and probable restoration of the patient) is the undue regard which is paid by him to the wishes and opinions of the friends who seem to take a pleasure in enlarging upon the odd whims and irregularities of the patient. The fears of one party, and the ignorance of both, soon settle the question, and at once precipitate the poor sufferer from a state of comparative sanity into irremediable madness. A medical man will do well to prefer even the immethodical relations of the patient, rather than trust to the opinions of friends ; for how often is it that actions, seemingly the most whimsical, may be strictly consistent with the physical condition of the invalid : thus insane persons, tormented with feverish heat, delight in exposing themselves to cold air or water, while, as M. Esquirol observes, a disordered state of the digestive organs often renders them averse to taking food." 113.

The importance of attention being paid to the early symptoms of insanity cannot be over-stated ; but we must join issue with the author as regards the steps which should be taken upon a discovery of these. So far from having found friends anxious to make out the patient's case as worse than it is, and thus unnecessarily consign him to an asylum, we have too often observed the very contrary, an unwillingness to perceive that which has become obvious, and a delay in resorting to aid which has often proved detrimental to ultimate recovery. Moreover, the separation from home which he seems to regard as a calamity, is the step which is ordinarily essential to giving the patient a fair chance ; and Esquirol and Pinel, whom he quotes as stating the greatest number of cures are effected within the first month, certainly are alluding to the case of patients so circumstanced.

To treat an hypochondriacal or hysterical patient (and many of the author's observations in this chapter are applicable to such) as insane, would indeed be likely to aggravate their maladies; but when the diagnosis of insanity has been satisfactorily made out, seclusion cannot be accomplished too soon.

Effects of Deficient Ossification of the Cranium.—The following is part of a passage quoted from a paper upon the employment of compression in certain cases of *hydrocephalus*, which was contributed by Sir Gilbert Blane to the Med. and Phys. Journal for Oct. 1821:

"It occurred to me that the distention of the head and bregma is owing to a want of firmness and due resistance in the bony compages of the skull, which consequently yields to that effort of pressure with which the brain, in its growth, acts upon its parietes. In reasoning farther on the subject, it appeared to me conformable to some of the most approved principles of physiology, that, as there is a certain degree of tension and pressure necessary to the sound condition and action of parts, the withdrawing of this, by inviting afflux and congestion, produces serous effusion; and, for the like reason, there may be a deficiency of that interstitial absorption upon which the healthy state of this and of all other parts of the living frame depends."

The author adopts these views as explanatory of certain cases of epilepsy, cerebral congestion, and hydrocephalus; such imperfection of structure resulting from "improper nutriment, a strumous diathesis, and a lack of warmth of the skin during the first seven or eight months of infantile life." The cases of four infants are related, two affected with epileptic fits, one with "restlessness and general indisposition," and the other with "oppressed breathing and emaciation," in which the supporting the cranial bones by bandages seemed to be productive of benefit. From their small number, and the employment of other means of treatment likewise, they go for little.

Galvanism.—We quite agree with Mr. Grantham, that the application of galvanism in paralysis, and other chronic affections of the nervous system, has been too much neglected. Indeed, its administration seems to be confined almost to empirics, who apply it in all cases indiscriminately, and consequently do more harm than good. Why a full and fair trial of its medicinal powers should not be made in some of the numerous chronic cases which encumber the hospitals, we cannot imagine. Mr. Grantham relates some cases in which he found this agent, carefully administered for a prolonged period, completely successful; and states the results of his experience in its employment in these conclusions.

"1. Galvanism is identical with the vital action of the nerves of organic life, and the nerves of volition. 2. Its action is determined by the healthy condition of the brain and spinal marrow. 3. The skin must possess a normal sensation, as well as temperature, before the galvanic action can affect the muscular fibre. 4. The positive plate or wire should be applied over the region of the origin, and the negative to the region of the termination of the nerve. 5. The galvanic influence, when passed along the spine, will be most active in the paralyzed limb. 6. Galvanism is assisted by the alkalis and mercurial action. 7. It restores diminished temperature, decreased circulation, and lost muscular action, in the following order: 1, temperature, 2d, circulation, and muscular action last.

8. It has no effect in disease that alters the structure of nerves. 9. It supersedes manual friction. 10. It is assisted by immersion of the affected limb in a warm bath, into which, the negative plate or wire is placed. In passing a current from the head through one half of the body, the foot should be immersed in warm water. 11. It is injurious when much pain is caused in the muscles by its application. 12. It may be carried to an undue extent, so as to produce congestion of the brain." 183.

Secale Cornutum.—Of this medicine the author thus speaks:—

"I have seen the uterus impaired, as to its future contractile power, after the use of large doses of ergot of rye, and have frequently had occasion, during the last two years, to apply the forceps to assist the parturient efforts of those persons in whom the practitioner had previously hastened the labour with the above drug. On the other hand, if the cases be properly selected, it forms a most useful auxiliary in effecting the expulsion of the fœtus. The ethereal tincture I have found very valuable in suppressing uterine hæmorrhage, and I am in the habit of giving one drachm, in a wine-glass of warm water, to mitigate the after-pain. It relieves the patient better than opium, and without producing any ill effect upon the sensorium. If too much discharge come on after delivery, I increase the dose to two drachms, and repeat it according to necessity." 195.

Premature Vaccination.—Mr. Grantham believes, from the greater insusceptibility of the infant constitution, this operation is best delayed until after the termination of the period of lactation, *i. e.* about the ninth month. He has come to this conclusion from observing that children vaccinated earlier are more liable afterwards to contract small-pox than those vaccinated at a later period. He quotes some observations, by Mr. Deane and Dr. Murray, of Cape Town, as confirmatory of the superior protective power of late vaccination. The last-mentioned experienced practitioner recommends the operation being delayed only to the 5th or 6th month. If a greater durability of the protective power really does result, the immediate consequences of delay need not excite much alarm; for young infants, however much exposed to infectious diseases, seldom contract them, and are sometimes the only members of the family who escape. When small-pox rages epidemically, however, no delay should be allowed, and we have seen very young infants infected, (and they usually die when they do contract the disease,) during the epidemic of this last summer and autumn.

Fibrinous Diarrhœa.—The *Diarrhœa Tubularis* of Good. This is a rare and often an obstinately chronic disease. In all the cases which the author has seen, its production has been preceded by the exhibition of mercury, with the too active employment of aperients.

"In the cases that have come under my notice, the discharges from the intestines have assumed, in the first stages of this complaint, a mucous appearance; secondly, a mixed muco-fibrinous character; and lastly, the evacuations have contained true fibrin. The evacuations of fibrin have been preceded by long-continued pain in the abdomen, and great irregularity in the temperature of the skin; the individual being highly sensitive to a damp atmosphere, which caused spasmodic pains in the abdomen. When the mucous membrane of the fauces and posterior nares is implicated in the disease, the patient suffers much from violent pain in the head, referrible to the region of the parietal bones, with ex-

treme irritability of mind. There is a great tendency to acidity in the stomach, which is increased under the use of a liquid diet. The abdominal pains are always of a spasmodic character, and at times very acute, extending to the neck of the bladder, and down the inner part of the thigh. The tongue assumes a white appearance, with indentations round the edges; sometimes ulcerations of a phagadænic kind forms over the tonsils. The pulse is seldom altered, generally maintaining a steady, healthy, feel; the skin is often studded with numerous papulæ, especially over the chest, neck, and face. The urine denotes an anæmic condition of the kidneys: occasionally such patients pass urine with evident traces of albumen, seldom containing a normal quantity of the phosphates. On an increase of fever or mental excitement, a larger quantity of the lithate of ammonia is found; frequently the mucous membrane of the bladder is thickened in these cases. The fæces, which are very seldom incorporated with the fibrin, are often very healthy in appearance, clearly showing a natural action of the glandular system. Although it is said by most authors that this disease is by no means fatal, yet I think I have seen it degenerate into atrophy of the intestines." 205.

Mr. Erasmus Wilson, writing to the author, after alluding to two cases which he had noted, and which occurred independently of the administration of mercury, observes—

"I do not agree with Dr. Golding Bird in thinking the principal seat of the inflammation in this disease to be the mucous follicles, nor does the false membrane appear to me to be simply an altered mucous secretion. The mucous follicles may, and very probably do, constantly participate in the inflammation of the mucous membrane: there is nothing anti-physiological, moreover, in supposing that they may be inflamed separately from the mucous membrane. But the character and appearance of the membranes that I have examined, their breadth and continuity, have led me to believe that they are a product of the superficial mucous surface. Animal chemistry can avail us little in determining the nature of a deposit of this kind. Protein, albumen, gelatin, fibrin, mucus—all are composed of the same elementary constituents, varying so slightly in proportion, that it is clear that they are all modifications of the same staminal principle. In croup, we do not hesitate to ascribe the production of the false membrane to the superficial mucous membrane; indeed, we have seeming proof that this is the case in the smaller relative proportion of the infected membrane; I am therefore desirous of claiming as much for the pulmonary mucous membrane in another place—namely, in the alimentary canal.

"Against my hypothesis of the analogy between croup and fibrinous diarrhœa, you might be inclined to urge the acute inflammation of the former, and the chronic character of the latter. But the latter is chronic only in duration. Its seat is limited and dispersed, and the patches which produce the lymph are each, as I imagine, as acutely inflamed as the pulmonary mucous membrane in croup." 215.

In the *treatment* of the disease, Mr. Grantham recommends residence in a dry locality, warm clothing, friction and ablutions, regular exercise, with a mild, moderate, unstimulating diet. Purgatives must not be resorted to but as an occasional means of removing painful accumulations of fibrin; when castor oil is the best. A tepid enema, with or without narcotics, to be used every morning. Alkalis may be given according to the condition of the gastric secretions and the urine. In obstinate cases, injections of nitrate of silver are useful; but stimulants, such as copaiba, turpentine, &c. are useless. In one bad case, cod's liver oil improved the condition of the patient without curing the disease.

"In conclusion, the treatment should be of a negative character, by which I mean, avoiding everything that may interfere with the natural law of the part affected; or, in other words, let the organism of the intestines effect its own restoration. It is better to keep that principle in view during the treatment; yet, on the other hand, all irritants must be removed, and acute pain must be subdued. In the early stages of the complaint, when the evacuations are of a mucous or muco-fibrinous character, the hydriodate of potash with morphine, may be given with advantage, the former in ten-grain doses night and morning, with half a grain of the latter at bedtime." 208.

A PRACTICAL ENQUIRY INTO THE VALUE OF MEDICINAL NAPHTHA IN TUBERCULAR PHTHISIS. By *Ed. Oct. Hocken*, M.D. Physician to the Blenheim-street Infirmary, &c. &c. &c. 8vo. pp. 72 Highley, London, Nov. 1844.

WHENEVER we hear of a remedy for tubercles in the lungs, we feel a scepticism rising in our minds. When recovery takes place, what proof have we that tubercles existed—or that they were removed by any specific medicine? Scarcely a day passes that we do not see and hear young doctors diagnosticate the existence of tubercles in the lungs—often, according to their own account, when they are not larger than pins' heads! In such cases, it is not unlikely that naphtha, or pure air, or prussic acid—or TIME will effect a cure of "tubercular phthisis." In the early stages of pulmonary tubercles we believe that they cannot be detected, and therefore the vaunted cures are more than doubtful—in the confirmed and obvious cases, the result is not at all doubtful—being DEATH in 99 instances out of 100!

Dr. Hocken truly informs us that auscultation and percussion require "a *natural* delicacy in hearing and appreciating sounds," as well as a "*taught and thoroughly-practised ear*" to interpret those sounds. In the succeeding page, he tells us that "he believes his sense of hearing to be naturally *excellent*, as he has found himself capable of distinguishing and appreciating sounds which were not detected by some others engaged in the same pursuits." In addition to all this, he informs us that, "during the last ten years, he has possessed very ample opportunities of gaining proficiency as an auscultator"—and that, during this time, "he has studied under some of the best auscultators in the world." We would hint to the ingenious author, that it would have exhibited more "*natural delicacy*," on his part, if he had employed some friend, or one of his master auscultators, to pen the foregoing particulars.

Dr. Hocken commences his preface with the following declaration:—"The author has put forth the following essay, with a sincere desire to benefit *others*, and entirely without the probability of benefiting *self*." This has been the declaration of almost every author who has ushered an infallible remedy for an incurable disease into the world. For what purpose does Dr. Ramadge render "*consumption curable*," but for the benefit of others?

Our author was stimulated to the investigation in question by "the fact

that every case of the disease, sufficiently advanced to admit of a positive diagnosis, had invariably progressed from bad to worse, and from this to death." He candidly acknowledges that he commenced the exhibition of naphtha with complete disbelief of its medicinal utility in the disease under consideration—"believing this to be, in its nature, incurable." The number of cures which he has accomplished by naphtha raises some sceptical feelings in our breast, as to the great perfection which Dr. H. has attained in auscultation. The "post hoc ergo propter hoc" argument has done more injury in medicine than any twenty other causes put together. It is known that neither tubercular depositions, nor even tubercular excavations, are invariably fatal. But a remedy, in such cases, gets the credit, where Nature was the doctor!

"Several remarkable cases of phthisis," says Dr. Graves, "have occurred in my own practice, and in the practice of Dr. Stokes, in which the patients recovered either temporarily or permanently, in a manner quite unforeseen and unexpected. In some, recovery took place after the occurrence of abundant tubercular deposition and crepitus, and in others after the formation of tubercular cavities. Facts such as these ought to prevent the practitioner from placing too great reliance upon stethoscopic examinations as a positive means of *prognosis*; for it may be looked upon as established that phthisis, like most other diseases, *does not always necessarily progress to a fatal termination*." 3.

Medicinal and Non-Medicinal Naphtha.—The difficulty of getting real medicinal naphtha is so great, that we almost despair of obtaining this invaluable specific.

My own observations would lead me to the conclusion that *two-thirds* of those who have tried naphtha in consumption, including *all* those who have found the substance they have employed either useless or injurious, (and have thus apparently failed,) *have not* used the medicinal naphtha, which I have exhibited with constant relief, and in many cases with a curative effect, to my patients—being the same which Dr. Hastings recommends and employs." 5.

The best naphtha that our author has obtained, has been at White's (Piccadilly) and Bell's, in Oxford-street.*

"The physical characters of the medicinal naphtha are as follows:—When pure, it is a *colourless*, limpid liquid, readily miscible in all proportions with water and alcohol, having a specific gravity at 60° F. of about ·800.

"The smell is alcoholic and peculiar—being a compound smell of alcohol and acetic ether, with something rather nauseous and bitter, but *by no means very unpleasant or disgusting*.

"The taste is warm, alcoholic, and rather nauseous—far, however, from being either very unpleasant or disgusting. Patients have invariably told me, that although they could not consider the naphtha pleasant, still it was not at all worse to take than any thing else bearing the name of medicine.

"Hence if a liquid be offered for sale of a dark colour, oily appearance, or which becomes milky on the addition of water, it is obviously a non-medicinal specimen; so also if it possess a very nauseous, sickly smell or taste.

"Specimens, however, may be found which agree in all these particulars, and yet belong to the non-medicinal class. I have several times tried a specimen which is more purely alcoholic in its taste and smell, and without the slight nauseous flavour and smell of the medicinal, which invariably disagreed with

* Mr. Bullock, in Conduit-street, manufactures the article.—*Rev.*

the patients, aggravated all the symptoms, and produced headache and sickness. These very patients had been previously much benefited by the medicinal naphtha, and were again speedily relieved from all the distressing symptoms by returning to it, and by leaving off the liquid which disagreed.

"The medicinal naphtha occasions a sense of warmth on being swallowed, usually followed by expulsion of flatus, soon succeeded by a comfortable sense of freedom of respiration, with relief of the distressing shortness of breath so constantly experienced by the phthisical. The peculiar odour of the medicine is imparted to the breath and sputa, and sometimes to the urine passed shortly after its use. In no case have I found the medicinal naphtha derange the stomach or bowels, or produce any unpleasant symptom. Hence if nausea, vomiting or purging, faintness, giddiness or headache follow the exhibition of any liquid used as naphtha, it should be rejected as a non-medicinal article." 6.

After a long disquisition on the chemical characters of the medicinal and non-medicinal naphtha, Dr. H. concludes that "the most ready test is, therefore, to be found in litmus paper, which is reddened by the non-medicinal, but is unaffected by the medicinal." As for the naphtha dissolving tubercles, according to some of its patrons, Dr. H. does not vouch for the fact. because "among the patients who had been taking naphtha, none had died except where the changes of phthisis had been very extensive and very far advanced." This passage alone would excite strong suspicion that those who recovered were not phthisical at all. The following is Dr. Hocken's delineation of the *physical signs* in those patients to whom he has administered the naphtha.

"The *physical signs* in these cases will be found to have chiefly been more or less *flattening* of the upper and anterior part of the chest, from a diminution of the antero-posterior diameter, affecting most commonly the right side alone, then both sides, and less commonly the left side alone; *diminished respiratory play* of the affected portion of the chest; more or less *dulness* and *resistance* on percussion of the sternal end of the clavicle, and of the sub-clavicular region (especially at a little distance from the sternum) of the affected side; increased *resonance* of the *voice* and *heart sounds* over the dull portions; alteration of the normal characters and rhythm of respiration, viz. *loudness*, *harshness*, and sometimes *dryness* of both the *inspiratory* and *expiratory murmurs* with *prolongation* of the *expiratory*—sometimes *weakness or suppression of the respiratory murmurs*—these states passing into the slight diffused *bronchophony* and *bronchial breathing*, which increases with the increase of the condensation, till the bronchial characters are more intense, and the voice is transmitted with the characters to which Laennec applied the name of imperfect pectoriloquy. These patients suffer from hectic fever in different degrees, pain in one or both shoulders, cough, generally hæmoptysis, and difficulty or rather shortness of breathing (breathlessness) with mucous expectoration. They have generally near relatives, who are suffering or who have died of consumption, (especially if they have attended much on their sick friends), and are often the children of phthisical parents." 12.

We candidly admit that, if those patients who presented the foregoing phenomena recovered by the use of naphtha, it is the most valuable medicine that has been discovered since the days of Hippocrates. But, the "*delicacy and accuracy*" of our author's ear, and his ability to hear and appreciate sounds which others could not, rise on the mental horizon, and darken the visions of hope that were crowding on our imaginations.

As we cannot take account of the twenty-three cases that are recorded,

in this brochure, we will quote the first case on the list, as a fair specimen of the rest—some of which, however, were more grave—others less.

"Case 1. *Tubercular deposition in the upper and anterior portion of the superior lobe of the right lung. Complete recovery from the influence of Naphtha.*—Henry Bonnar, ætat. 23, admitted under my care, at the Blenheim-street Infirmary, on the 2d of March, 1844, resides at 50, Salisbury-street, Lisson-grove. Complains of indisposition, hectic symptoms, pain behind the centre of the sternum, and in the right shoulder, with slight cough, especially in the early morning, with expectoration of transparent mucus. These symptoms have come on gradually during the last two or three months. His father is at present (March) under my care, in an advanced stage of phthisis.

Physical signs.—Slight dulness of the sternal end of the clavicle, and of the upper and sternal portion of the sub-clavicular region of the right side on percussion; morbidly increased resonance of the voice and heart sounds; murmurs harsh, expiration prolonged.

"Ordered Naphthæ Medic. ♏ v. ex cyatho aquæ ter die.

"March 9th. Slightly improved. To continue as before.

"March 30th. Chest symptoms relieved; general health much improved. To continue.

"April 6th. Complains of much general indisposition, and pain in the right shoulder. The dulness on percussion is sensibly diminished since the last examination; murmurs less harsh; voice highly resonant.

"To take an ounce three times a-day of the following mixture:—℞. Inf. Gent. Comp ℥ viij. Naph. Med. ʒ iij. M., to apply a blister over the sternum.

"April 13th. General and local symptoms improved. To continue, and to produce and keep up an eruption over the front of the chest with the Ung. Antim. Pot. Tart.

"April 20th. Improvement continues.

"May 4th. Has neither pain nor uneasiness about the chest or shoulders; cough and shortness of breath greatly relieved; little or no expectoration; still continues to be fatigued, and to perspire freely from slight causes, and is subject to attacks of faintness. The dulness has entirely disappeared; the murmurs are soft and normal, but the voice is still slightly more resonant over the right subclavicular region than over the left.

"May 11. Feels perfectly well, and has continued in the enjoyment of perfect health up to the present time (Sept. 1844)." 13.

In his general conclusions on the cases detailed, Dr. Hocken observes that it is in the chronic forms of the disease that naphtha is most serviceable, "especially where the predisposition to phthisis is not very powerful, and where the tubercular deposition is limited in extent." The earlier the stage of the disease, the greater will be the chance of benefit from the remedy. "Extensive and advanced disease, previous to softening of the tubercles and the formation of caverns, are, *as a general rule*, curable by naphtha." This is by far too sanguine a sentiment. Dr. H. believes that, when excavations have occurred, the disease is incurable.

"The beneficial action of naphtha is seen in the relief of the breathlessness of the patient, the cough, and expectoration; also in the relief of the hectic, the profuse sweating, diarrhœa, &c. Its action on the physical signs is first manifested in the diminution of the dulness on percussion, diminution of the increased resonance of the heart sounds and voice; a softening down of bronchial breathing into simple harshness of the respiratory murmurs, with a prolongation of the expiratory; then a gradual diminution of these morbid states, and a steady return of the normal murmurs of health." 68.

We would not wish to discourage the trial of any remedy which offers the slightest chance of arresting a disease so destructive to the human race as phthisis is: but from what we have seen of naphtha, and from what we know of the malady, we confess that our expectations are much less ardent than are those of Dr. Hocken, whom we believe to be a young but a talented physician.

Precis d'Anatomie Transcendante, appliquée à la Physiologie. Par *M. E. R. Serres*, Membre de l'Institut, Professeur au Museum d'Histoire Naturelle, &c. Tome Iier. 8vo. pp. 270. Paris.

We hope that none of our readers will allow themselves to be scared from the perusal of the following pages, by the epithet that is here applied to the sciences of Anatomy and Physiology. The term "transcendental" is a very unfortunate one; for, without conveying any distinct intimation of its meaning, it at once suggests, in the present day, the idea of some abstruse mysticism about matters that are beyond the reach of common minds. True it is, that of late years it has rarely been used, except in reference to the metaphysical doctrines of Kant and other German writers; but the word, although rather pedantic, is nevertheless of English growth; for we find it in the works of some of our older authors. Dr. Johnson defines it, in his dictionary, to be "general," "pervading many particulars," "supereminent;" and *Bailey* explains the expression of *transcendentals* as signifying the "universal conceptions of things." Let us now hear in what sense our author uses the term. "Transcendental Anatomy," he says, "is that branch of physical science which treats of the mode in which animal bodies are developed, and of the successive changes or phases that they undergo during this process; and which at the same time points out the various analogies that may be traced between these changes in the embryos of the higher animals, and the permanent forms or structures of those that are lower in the Zoological scale."

The field of inquiry thus embraced is a very wide one: for it comprehends not only the perfect and mature organisms of the various orders of animal beings, but also these organisms in the different stages of their evolution and growth—from the period of conception to that of their complete development. The phenomena, therefore, of which it treats, naturally resolve themselves into two great groupes: viz., on the one hand, the transitory forms which the organisms in the higher animals exhibit during their development; and, on the other, the permanent forms of these organisms in the lower animals. As we follow out this curious subject of inquiry, we shall find that there is good reason to believe that the primitive condition of all animal structures is very nearly, if not altogether, the same; and that the chief differences, which they afterwards display, may be traced to the operation of a few simple laws that we shall endeavour in the following pages to point out and explain.

From this brief statement, it will be obvious that the phrase, Transcendental Anatomy, has a meaning not very different from that of Formative or Embryological Anatomy; using the latter expression in its largest and most comprehensive sense,—to denote the study of the evolutionary formation of the different organisms or structures in all animals, and of the various analogies and resemblances that exist between them. Need we add, that the study is one of the very highest philosophical interest, and that it therefore behooves every medical man, who has the dignity of his profession at heart, to make himself acquainted with its general bearings and best established phenomena?

The science of Transcendental Anatomy and Physiology is, in a great measure, one of modern creation; for—although we meet with not a few allusions to its particular doctrines, and in several instances with some very happy conjectures on the subject, in the writings of the old anatomists—it was certainly not, until about the beginning of the present century, that a decidedly successful attempt was made to discover any of those laws, which preside over and regulate the development of animal structures.

This somewhat remarkable retardation of embryological science will be found, we think, to have arisen from the same source of error, that proved so injurious to the advancement of other branches of knowledge, before the discipline of the Inductive Philosophy was rightly understood. Physiologists had always been too ready to frame theories, before they had provided themselves with the proper materials to base and build their theories upon. Thus, in reference to our present subject, it was too generally taken for granted that the embryo of an animal was, from its first appearance, only a mere miniature representation or copy of the being from which it sprang; and hence it came, almost as a necessary consequence, that almost every physiological inquirer concluded that the process of development was nothing more than a gradual evolution and expansion of different parts and structures, that were already existing in the nascent organism. There were, indeed, it was confessed by all, some peculiarities in the conformation of the embryo, that it was by no means easy to account for in this way, and which certainly seemed to be at utter variance with the idea of different organs being developed *ab initio* in the exact condition which they afterwards exhibited. For example, the question would naturally propose itself, why were the Testes formed in the loins, and afterwards transmitted through the abdominal rings into the bag of the scrotum; and what explanation was to be given of the primary formation and subsequent removal by absorption of the *membrana pupillaris* of the eye? On the subject too of Organic Anomalies—or Monstrosities, as they have been rather inaptly called—no rational hypothesis could be even so much as suggested. To refer them to the operation of disease in the fœtus itself, or to the influence of the maternal mind on her offspring, or to the direct agency of diabolic malevolence, &c. might indeed be a ready way of solving the difficulty to the minds of the vulgar; but no sensible Physiologist could be satisfied that such causes—if we can deign to call them so—should occasion, for example, a harelip, or a cleft palate in one instance, and the absence of the heart or of the brain in another.

The whole of the first part of M. *Serres'* work is occupied with an exposition of the two leading.

Theories of Embryotic Development—the ancient and the modern. According to the one, we are taught to believe in the presence of the different organisms of the body in the embryo, from the very commencement of its being; while the other is based on the idea that there is a series of successive developments and phases of evolution of all its parts, beginning in the most simple forms, and these gradually becoming more and more complicate. The former our author designates "The Doctrine of Pre-existences;" and the latter "The Doctrine of Epigenesis."

He gives a rapid sketch of the writings of physiologists—from the time of Aristotle down to the close of the last century—in as far as they bear on this subject, and from this review he shows how almost universally the first of these theories prevailed until the end of last century.

We cannot afford space to follow him through the early part of this inquiry, but shall at once proceed to notice the account which he gives of the labours of our distinguished countryman *Harvey*—premising, however, that our readers must take it for proved that the Doctrine of Pre-existent formations has been shown to be utterly untenable.

"With that eagle glance," says M. *Serres*, "which characterized all the efforts of his genius, Harvey had made some approaches to a far more correct system of embryological doctrine than was prevalent in his day; and he would probably have anticipated many of the unlooked-for discoveries of modern times in this most interesting branch of anatomical science. had he not stopped short in his inquiries, and commenced to indulge in speculations, instead of continuing persevering to observe and record the phenomena of nature. As he could not see the embryo in the *chalazæ* of the ovum, or the entire chick in the *cicatricula*—assertions that were almost universally believed in his day—he very naturally remarked: *Either it is true, or it is not. If it is, let me see it; but, if it is not, why should we suppose that it must exist? The science of realities is sufficiently tedious and irksome in itself; why then add to it the study of our dreams and the contradictions of our fancies?*" It was thus that this great man at once put a stop to the reception of the fantastic theories which were then in vogue: fortunate would it have been for the interests of Science, as well as for his own reputation, if he had rigidly observed his own precept. But, although (as we shall afterwards see) he, after entering upon the narrow path of truth, subsequently diverged into the broad and beaten track of error, "he,"—again, to use our author's language—"compensated for his mistakes by suggestions and intimations that almost rival in importance his immortal discovery of the Circulation. His memorable saying, *all animals proceed from an ovum*, is the very basis and fundamental position of every rational system of embryology; for certainly, no one now denies that an ovum is the universal *matrix* of animal life. And if it be admitted that all animals proceed from a common elementary formation, who does not perceive in this simple but expressive formula, the germ of the Doctrine of the Primitive Analogy that exists between them? —that doctrine which M. *St. Hilaire* has worked out with so much ingenuity and success;—and is not the physiological inquirer led, at the same time, to begin to suspect that the evolution and development of all animal structures must be determined by the same general laws, and after one common model or type? Harvey's own words clearly show that he took

this view of the subject; for we find him saying, in his great work on Generation, *Quippe in omnibus eodem modo atque ordine procreatur; præsertim in perfectioribus animalibus, atque ipso adeò homine.* As a necessary consequence of this and such-like statements, he clearly foresaw, as we might anticipate, the grand discovery of the present century, viz.: that the embryos of the higher tribes of animals, and of man himself, must, during the progress of their development, pass through conditions which characterize the organization of animals that are beneath them in the scale of existence. The passage in his *Exercitatio Anatomica de Mortu Cordis*, in which he distinctly enunciates this memorable and somewhat startling truth, is too important not to be quoted as it stands in the original: *Sic natura perfecta et divina, nihil faciens frustra, nec cuipiam animali cor addidit ubi non erat opus, neque, priusquam esset ejus opus, fecit; sed iisdem gradibus in formatione cujuscunque animalis, transiens per omnium animalium constitutiones, (ut ego dicam,) ovum, vermem, fœtum, perfectionem in singulis acquirit. Hæc alibi in fœtus formatione multis observationibus confirmanda sunt.*"

In this brief sentence we recognise the germ, so to speak, of the Epigenetic Doctrine of Embryology, and of some of the most important discoveries which have adorned this branch of science in the present century; for here we have it clearly enunciated, that the various organs and structures of the animal do not exist in the primitive *nucleus* or *cicatricula* of the Ovum; but, on the contrary, that they are subsequently and successively developed by the addition, the super-position, and the cohesion of different parts.

So far, therefore, Harvey was altogether on the right way; but, at this very point of his dissertation, we perceive that a spirit of speculation unfortunately begins to be blended with the details of actual observation.

Among other fantasies, he adopted the strange notion that the commencement of existence in the higher animals is to be dated only from the earliest appearance of the pulsations of the heart; and that the anterior development of the Embryo should be considered as appertaining to vegetable rather than to animal life. This utterly unsupported hypothesis led him to entertain the belief that it was from the heart,—the *punctum saliens*—as from a centre, that all the subsequent growth of the young being proceeded. Here was the grand error that he committed; the false step that led him away from the rich prize of discovery that now seems to have been almost within his grasp.

It is singular to find, as we pursue our inquiries, that the really truthful part of Harvey's exposition of Zoogeny was so little attended to by subsequent anatomists. Even Haller—who had examined most attentively for himself many of the phenomena exhibited by the embryo, at an early period of its existence, and was perfectly well aware of the marked difference in many of its parts *then*, and at the time of its mature development—adopted (we might almost say, in spite of his own observations) the generally received doctrine, that the young being is nothing but a mere miniature representation of its ultimate formation, and therefore that the process of development consists in the mere evolution or expansion of originally existing parts.

The absurdities, to which this belief carried him, are worthy of notice

only as affording an instructive warning to future physiologists. Without embracing the opinions of Aristotle and Harvey, that the life of the Embryo was merely of a vegetable type or nature before the appearance of the *punctum saliens*—for this opinion had been completely overthrown by the beautiful microscopic researches of Malpighi—he boldly hazarded the extraordinary idea that, although the heart be not visible and even not formed, its impulsive action might nevertheless exist. In short, he believed that there might be a function present without an organ, an acting power without an instrument to work with; and, what is singular, this very supposition led him to interpret the development of the Sanguiferous System in the very inverse order to that which he had discovered by his observations to be the case. So far astray will one wrong step often lead even the most enlightened physiologists.

There were two contemporaries of Haller, whose observations and writings tended not a little to shake the general belief in the Doctrine of Pre-existent Formations, and thus to pave the way for the introduction of the rival creed in Embryology—that of Successive and Consecutive Developments, or, as M. Serres terms it, the *Epigenesis* of animal structures. The first of these was Needham, who examined with great care the mode of development in the Infusory Animalcules which are found in vegetable infusions; and who—without apparently being aware of the ideas of Harvey respecting the transformation of animal beings during their evolution—came to the conclusion that, in some, the progress of development was arrested at one period; in others at a second; and in others at a still more advanced period or stage of their growth. He therefore very properly inferred that the primary germ or ovum of the animal being could not contain any miniature representation of its future framework; but, on the contrary, that there was a progressive addition of new parts or formations until it (the fœtus) was completely and maturely developed. As a corollary deducible from these views, we cannot be much surprised that Needham entertained the belief that animal and vegetable substances are primarily of the same nature, and that, under certain circumstances, they are convertible the one into the other.

Wolf confirmed the accuracy of many of the observations of the Dutch physiologist, and showed that the different organs of an animal body are evolved in succession; one *after* the other, and even one *from* the other, in the way of secretion. To him we owe the profound remark, that "primarily all the parts of an animal are in a fluid and, as it were, an inorganic condition, and that subsequently vessels are developed wthin it by a peculiar and self-generating action."

After the time of Wolf, nothing important was done in the field of Embryological research, until the beginning of the present century, when the admirable investigations of M. *Geoffroy St. Hilaire* in France, and of *Meckel* in Germany, were made known to the world. These, in connection with the subsequent labours of *Oken*, *Spix*, *Baer*, *Blainville*, *Serres*, &c., have completely established the foundation, and reared the superstructure of the modern theory of embryology—the most prominent and indeed the essential positions of which are—1, that the embryos of all animals are at first nearly or altogether alike; and 2, that those of the higher orders of animals pass through a series of successive phases of

development, each of which has its type or analogue in the permanent configuration of the lower tribes of animal beings.

To understand this theory aright, it is necessary that the reader be first made acquainted with the two great laws of Embryological development, for the clear enunciation and establishment of which, science is mainly indebted to the genius and industry of our distinguished author. These are the laws of the Primary Duality, and of the Centripetal or Eccentric formation, of all animal organisms.

By the first of these expressions, M. Serres means to intimate that all animal bodies are primarily developed *bifid* or *dual* ; *i. e.* as consisting of two lateral and similar halves, each one of which is an exact representation of the other. An obvious consequence of this law must be, that all the different organs, situated in the median line, will at first consist of two homologous portions—developed apart; but which may, or may not, afterwards unite or coalesce, so as to constitute but one individual organ.

As we proceed in our inquiry, we shall meet with numerous illustrations of this law; but perhaps the best exposition of its truth will be made by tracing the early changes observed during the development of the chick. The following extract from our author may therefore be read with considerable interest:

"The *ovum* in the female before impregnation consists of three fundamental parts—an investing external membrane, the *chorion* ; a vesicle called the *proliferous vesicle* ; and the *vitellus*. This last part is at first colourless and without any yellow globules. As these form, the Proliferous Vesicle, which is filled with a clear fluid, rises to the surface of the Vitellus, and is maintained in its place there by a disk or ligament, to which the term of *proliferous disk* has been given. The object of the eccentric position of the Vesicle seems to be, that the seminal fluid or *Zoosperm* of the male may be brought immediately in contact with it—an indispensable condition to all fecundation. The immediate result of this contact is the rupture of the Vesicle, and the escape of its contents,—now impregnated by the Zoospermic agency—upon the capsule of the Vitellus. The first 12 or 15 hours of incubation are employed by nature to isolate the Proliferous Disk from the membrane of the vitellus; the embryo thereby acquiring an area of independent existence (le champ de l'embryon prend ainsi son indépendence). As yet, there is no appearance of any germinating process in the substance of the disk itself, and it continues to be homogeneous throughout. At about the 16th hour of incubation, we perceive the first trace that precedes the development of the organisms. This consists in the appearance, in the axis and about the centre of the disk, of a darkish-coloured line which gradually extends, first upwards and then downwards, to its other extremity. While this is taking place along the median line of the Disk, the edges of its circumference begin to bulge out a little, and they gradually become more and more raised up, until at length there are formed two cells or sacs (*sacci germinativi*), one on each side of the dark-coloured streak in the middle. This therefore may be said to be the first act of development, viz. the division of the proliferous disk into two equal parts—a right and a left one—which are separated from each other by an interval known by the name of the *primitive line*. Embryologists have not been agreed as to what constitutes this line of demarcation; but we feel quite satisfied that in truth it is nothing more than a mere empty space or interval between the two germinating sacs; and therefore that it is neither the *zoosperm*, as Prevost and Dumas have imagined, nor the rudiments of the spinal marrow, as Wagner has supposed."

According, then, to our author, the Embryo is to be regarded, at this period of its existence, as consisting of two lateral and similar halves, in each of which the process of development goes on equally and simultaneously. This is the key, so to speak, to that great and important law in Embryology, which is designated by our author as the Law of the Symmetry or Duality of the organism :—it is sometimes called, in compliment to him, the *Lex Serriana.* Our limits forbid us to enter, at any considerable length, into an illustration of this fundamental principle ; and we must therefore refer the curious reader to M. Serres' treatise for particulars. Suffice it for our purpose to say that, according to him, (and other high authorities on the subject,) all the viscera and organs of the body consist at first of two distinct lateral halves, equal and similar to each other in all respects, but which may subsequently coalesce and become incorporated together, so that no trace of their primary median division remains.

That the Cerebro-Spinal Axis is developed in this manner is abundantly obvious : the two lateral cords of the spinal marrow are so distinct in the young embryo of Birds and Reptiles, and even of mammals, that no one thinks of disputing the fact in the present day. In many of the *invertebrata,* this Duality is persistent during life ; while in others, the nervous axis becomes single during the process of evolution.

The same thing may be predicated of the Heart, the Liver, and other organs, which in after-life are found to be not only *impar*, i. e. consisting of two unequal halves, but are situated altogether on one side of the body. However startling the assertion may be, there is ample reason to admit that, at first, these parts were all placed in the median line of the body, and that then they consisted of two equal lateral moieties, which subsequently coalesced, and became so incorporated, as to constitute but one undivided mass. The conformation of the Penis in the male, and of the Clitoris in the female, affords a good illustration of this. The lateral halves, of which these organs originally consist, sometimes do not coalesce uniformly and throughout their entire extent; and then we find that a deep rut or groove remains after birth along their upper surface, in the direction of the median line. At other times, the Canal of the Urethra does not close, but continues more or less completely open, along the entire extent of its under surface. The explanation of such irregularities is very simple and obvious : the two lateral halves, of which the parts originally consisted, have not become joined together, as they normally are, so as to form a uniform and continuous whole. In the example now quoted, we have a most convincing illustration of the process of "Dual Formation ;" but perhaps not more conclusive than what is afforded by congenital fissures of the lips, palate, and uvula, or by Spina Bifida, or by a bilobed state of the uterus, &c.

The consideration of this elementary position prepares us for the better understanding and the more ready admission of the other fundamental principle in Embryology, which M. Serres has the merit of having first clearly enunciated, and the truth of which he most ingeniously labours to establish by many and varied arguments—we mean the "Centripetal Law," as he terms it, "of Development." By this expression we are to understand that all living organic matter is primarily developed at the surface,

and that the process or act of Development goes on in a direction inwards, from the surface towards the centre. If we take the Brain, for example, it is asserted by our author that the periphery of its hemispheres is formed long before the *corpus callosum*, or the *septum lucidum* is even visible. If the truth of the general position be admitted, we have then a very marked feature of distinction between the ancient and modern theories of Embryotomy. As we have already stated, it was the almost universal belief of the old physiologists, that the development of the various parts and organs of an animal body proceeded from the centre to the circumference; and we have seen how Harvey, after having made some important discoveries in the right way, allowed himself afterwards to be diverted from it by his favourite dogma, that life emanated from the *punctum saliens*, as from a starting point. Now the very reverse of all this is at length discovered to be the case, and we are now assured that the circulatory and nervous systems are developed according to the Centripetal law, *viz.* the blood-vessels at the periphery first, and subsequently the Heart; the nerves first, and subsequently the Brain and Spinal Marrow.

A vast number of the phenomena, exhibited by organic anomalies or Monstrosities, are in strict accordance with this physiological principle or position. The peripheral parts of the body as a whole, as well as of its separate organs, are never found to be awanting when the central parts are developed. For example, we never meet with a monster that is provided with a heart (however rudimentary this may be), but without blood-vessels; or with a Cerebral or Spinal Axis, but without nerves. Again, there is no instance known of one of the cheeks being absent, while the lips were formed; or of a lateral half of the penis being awanting, while the canal of the urethra was entire. And why?—simply because the formative process in every part goes on from the circumference towards the centre; and never in the opposite direction.

Having thus, although very imperfectly, noticed two of the leading elementary laws of Organology—those of the Duality, and of the Centripetal formation of the body—we are now prepared to advance another step in our inquiry; *viz.* to advert to a third general law or position of the science, which it is very necessary to understand, before we can explain many of the phenomena of animal structures. It is called by our author the "Law of the Fragmentary Division (*fractionnement*) of the Organs." The following extract will best convey his meaning.

"Whatever be the organ of the body, whose development we endeavour to follow out, we shall find that it primarily consists of several pieces or divisions; its mature and permanent form being the result of the coalescence and fusion together of these separate parts. The liver was originally composed of three or four separate portions or lobes; eventually these become so blended together that the lines of junction are scarcely, if at all, recognisable. In the same manner, the Prostate Gland was at first trilobed or quadrilobed. The Kidney in the adult state is a simple uniform organ, whose surface is so smooth that it exhibits not the slightest traces of any previous disjunction; and yet, in the embryonic state of the human being, this viscus, it is well known, has a multilobular formation, as permanently exists in quadrupedal mammalia. The development of the double or compound teeth affords another illustration of the same law. Who would suppose that they consisted at first of several distinct portions or segments? or that each eminence on their exposed surface was originally formed

by itself, and apart from the others? Yet this has been discovered to be the case; and we are now assured that, as the number of these eminences varies from two to five, so there may be as many as ten distinct *nuclei* of growth in the formation of a single tooth. It thus appears that the grinders of ruminant animals are in truth only an aggregation of several incisors into one, while those of the carnivora may be regarded as a mere groupe of canine teeth, that have become coalesced together."

Many other instances, illustrative of the same general fact, might be quoted from the development of the osseous system—all tending to prove that parts, which are single and uniform in the adult, are *fractionnés* into several segments during their early formation. Each Vertebra, for example, is found to exhibit four distinct *nuclei* of ossification; the Occipital bone originally consists of eight separate pieces, and the Sphenoidal of no fewer than twelve. M. *Serres* remarks that the original nuclei of separate ossification may often be detected in the adult bone, by the mere circumstance of these points being always of a closer and harder texture than the rest of its substance. The shafts of the long bones are much harder than their extremities; the lateral masses of the vertebræ than the bodies of these bones; the posterior lamina of the occipital bone than its basilar process; and so forth. "The solidescence is therefore," adds he, "a sure guide to discover in the bones of adult animals the original traces of their osteogeny. Such being the case, we can easily perceive the application that might be made of this law to Palæontology or Fossil Anatomy, not only as regards the bones of the vertebrate, but also the solid parts of invertebrate, animals. In the formation of shells, too, and the outer cases of insects and the crustacea, we find that the development commences in those points which are the hardest and the most compact. This is a general rule of Organogeny."

The primary Fragmentary Division of Organs may therefore be received as one of those important general truths of embryological anatomy, which it is the great object of the present work of M. *Serres* to establish; and certainly none is more curious than this, viz: that the organs of the body are more and more decomposed or subdivided into fragmentary segments, in proportion as the embryo is less and less advanced in its development: the earlier the embryo, the greater is the amount of *fractionnement*.

With these facts in view, it will not be difficult to recognise some of the very remarkable features of resemblance that may be traced between the successive transient states, which the Embryos of the higher animals exhibit during their development, and the permanent forms that exist in the lower tribes of animal beings. It may be laid down as a general law, that the organs in animal bodies become less and less complex in structure, and more resolved into their elementary constituent forms, in proportion as we descend in the zoological scale; until at length we find them reduced to their most simple and elementary configuration in the lowest members of the series. To illustrate the truth of this statement, let us examine the Comparative Anatomy of the Heart for example. Very complicated in the higher Vertebrata, this organ becomes gradually more and more decomposed—*i. e.*, resolved into its primary elements, so to speak—in Reptiles, Fishes, Crustaceous and Molluscous animals, the Annelides, and Insects. In each of these successive *degradations*, we find that it loses

either some part of its component elements, or a portion at least of its muscular apparatus; so that, at length, it becomes nothing more than a straight or slightly-curved canal, whose very muscularity is problematical. Now this is nearly its condition in the early human embryo. When first recognisable, it is not unlike to the normal and permanent structure of the organ which we perceive to exist in worms and insects. The earliest change, that is observed during the process of embryotic development, is the appearance of rudimentary auricles. When these are finally formed, the heart consists of three cavities, viz.: a ventricle in the middle, and an imperfect auricle, at some distance, on each side,—an arrangement, it will be perceived, that is very much the same as what exists in the Acephalous Mollusca. Subsequently the two auricles appear to approximate and join each other; and at length these two cavities form but one. Then we have a largely-developed ventricle, and a still larger single auricle—the very structure that is present in the Cephalous (cephalés) Mollusca. What is the next change? The single auricular pouch becomes divided into two compartments by a *septum*—the existence of which, according as it is more or less complete, represents the condition of the organ as we observe it to be in certain Fishes and Reptiles. The last phasis of this "strange eventful history" is when the ventricle itself becomes in its turn bilobular, in the same manner as the single auricle did. At the period when the ventricular septum is not completely closed, have we not an exact representation of the permanent condition of the heart in the Ophidian Reptiles?

The Osseous System also furnishes us with many illustrations of this highly curious and interesting *Law of Concordance between Organogeny and Comparative Anatomy*. The following extract from our author will best serve to convey our meaning:—

"We thus see—and this is a point well worthy of the attention of anatomists—that, whenever an organism is found *fractionné* in the human embryo, we may be assured that it is permanently multiple, or even that it has its component parts detached from each other, in some of the lower animals. The great number of the cranial bones in fishes, when compared with the number of the primary *nuclei* of ossification in the cranium of the early fœtus, affords one of the most remarkable examples of this general law of Organogeny. M. *St. Hilaire* has, with surpassing ingenuity, developed and illustrated this subject. Another instance is met with in the case of the *sternum*; the numerous pieces of which, in several Mammals as well as in Reptiles and Fishes, are perfectly represented by the number of the primary *nuclei* of this bone in the human fœtus, from the second to the fifth month of intra-uterine life. The same holds true with respect to the *os hyoides*. What variety does this osseous apparatus exhibit first in Mammals, and next in Birds, Reptiles and Fishes! * * * * * Again, in the human fœtus, from the third to the fourth month, the *superior maxilla* is found to consist of five distinct pieces, which afterwards coalesce and form a single bone: in the Crocodile, these five pieces remain permanently separate. In respect therefore of this bone, the Crocodile may be regarded as the permanent representative of the human embryo in the third month of its development; and *vice versâ*, the early embryo in this respect may be regarded as a transitory Crocodile, becoming at a future period of its intra-uterine existence a type of a Pachyderm or Ruminant animal, when the incisive portion of the maxillary bone is all that remains distinct and separated from the rest."

A still more curious feature of resemblance between the human embryo and the inferior animals is the unquestionable existence of a caudal pro-

longation in the former, from the 5th to the 7th week of its development. How would Lord *Monboddo* have rejoiced in spirit, had this discovery been made in his day!

The Visceral or Splanchnic System is no less prolific in examples of the same law of structural concordance than the vascular and osseous systems. The *kidney*, as we have already mentioned, is multilobed in the early fœtus; so it is in the elephant, the cow, &c. The *prostate* gland consists of four lobes in a three-month fœtus; so it does in the horse. The *uterus* is bilobed in a great many of the lower animals; the same arrangement exists in the human embryo. The changes, which the external organs of generation undergo during fœtal life, are perhaps as marvellous as any of the organic metamorphoses to which we have alluded. At a very early period, there appears to be no distinction of sex; subsequently all embryos seem to be females; and at a more advanced period, the female-looking organs appear to be transformed into male ones. All the females, at a certain period of their existence, have the appearance of being hermaphrodites; and all the males exhibit, at some time or another, that of females.

Having next very elaborately pointed out the successive transformations in the structure of the *encephalon*—each of these transformations having its type or analogue in the permanent condition of this organ in the different orders of the Vertebrata, from the Mammal down to the fish—M. Serres prefaces his description of the evolution of the alimentary passages with the following remarks :—

"The essential character of animal life does not reside either in the heart and blood-vessels, in the brain and nerves, or in the genito-urinary organs. An animal being may exist and live without possessing these organisms. Not so however with the nutritive apparatus. Life exists, and can exist, only on this condition—that an absorption of assimilable molecules is continually going on.—Hence it follows, on the one hand, that, as we descend in the scale of animal beings, we at length come to those which are reduced to a state of a mere absorbing bag or vesicle; and, on the other hand, that, as we ascend as far back as possible in our embryogenic examinations, we find the rudiments of the future man to be nothing more than a similar vesicle. Thus, the Monad is represented, so to speak, in embryogeny by the *proliferous vesicle* that has been so accurately described by Purkinje; and the Volvox and Proteus by what has been called the *cicatricula ovi*. In the primitive embryo, as in the Polype and Entozoon, the alimentary canal has no anal orifice, nor is there any appearance of a liver or other glandular appendage. It is in the crustacea, Insects, and the Mollusca, that we first meet with such organs: the same holds true of the embryo, in what may be termed the second stage of its development. In the ulterior metamorphoses or changes, which the digestive apparatus undergoes in the embryo, other and very remarkable analogies with the permanent forms, that are present in different tribes of the lower animals, may be readily pointed out."

If space permitted, we might also allude to the resemblances between the Respiratory organs in the Invertebrata, and those in the embryos of Vertebrate animals. Probably most of our readers are aware that, long before the development of proper *lungs* in the latter, the respiratory apparatus is essentially of the nature of *gills*; and that the young of certain animals of the Reptile tribe are at birth provided with the latter—to be replaced by the former at a future period of life, when the animal passes, for example, from the state of tadpole to that of the frog. Those, who wish to be acquainted with the analogical phenomena in the conformation of the early human embryo, should consult our author's description.

There still remain one or two other topics introduced and commented on in this truly original work, to which we would solicit our readers' attention for a few moments, before drawing our remarks to a close: and, first, of what M. Serres calls the *Gradation of Tissues in Zoological and Embryological Formations.*

"The primary or elementary tissue," says he, "in the lower Infusoria, as in the embryo during the first stage of its existence, is mere cellular substance, modified in a variety of ways. This is the common basis, so to speak, of the Monad, the Volvox, the Acephalocyst, the Ascidia, and of part of the Echinococcus and Polype. The essential properties of this tissue seem to be—1, a uniformity of function, limited to exhalation and absorption; and, 2, a power of independent existence, when a portion is detached from the rest. If to this tissue be superadded a peripheral system of blood-vessels, we advance one step in the animal scale, and come to part of the Echinodermata. If a muscular system be then added, we reach the Rotifera; and, if all these systems be combined, we arrive at the Helianthoidea. Whenever the muscular tissue is distinctly developed, we find that traces of a nervous apparatus—hitherto so blended and confused with the different parts of the animal body as not to be recognisable—begin to appear; as we observe for the first time in the Annelides, the Mollusca, and perhaps also the Crustacea. Now, a very striking analogy may be traced between these progressive gradations in zoological development and the successive changes that are discoverable in the evolving organization of the embryo. Before impregnation, the animal is represented by a mere vesicle that consists altogether of cellular membrane enveloping an oleaginous fluid. After impregnation, the *blastoderm*—from which proceed the constituent parts of the embryo—exhibits two membranes; one external and serous, and the other internal and mucous. In a short time, a vascular tissue is found to be interposed between these two; and subsequently a nervous tissue makes its first appearance."

Some light has been unexpectedly thrown on this subject by the results of certain experiments, which M. Serres has recently performed on worms and leeches. "The common earth-worm," he remarks, "is very different, it is well known, in its formation, from the Polype, the Tænia, the Helianthois, or the Arenicola; but, if we follow out the various metamorphoses which the animal undergoes before it arrives at its complete development, we find that it actually does resemble each of these creatures successively, according to its epoch of evolution. Now what is very remarkable is, that a counterproof of these successive advances or elevations of structure is afforded by watching the process which Nature follows in effecting the regeneration of a part, that may have been artificially destroyed. The *first* act of regeneration in the new-formed portion reproduces exactly the structure of an Arenicola; the *second* act (supposing the new-formed has been again destroyed) reproduces that of the Helianthois; while the third and last act degrades or brings the part down to the structure of a Polype.* It is obvious, therefore, that the reproductive

* M. Serres mentions that, while conducting these experiments on earth-worms, he quite satisfied himself that many of the alleged different species of this and other Invertebrate animals are, in short, but the same species, only at different stages of their development. The most advanced development is the ideal type of the genus; and the least advanced constitutes the last species of it. This remark is, in an especial manner, applicable to the case of the Infusory animalcules, which have too often been most unnecessarily grouped into a great number of different families.

power becomes gradually more and more feeble, just in the same manner as we observe that the reproduction of the organic tissues in the human body become exhausted, in any part, by a frequently-repeated act of regeneration. This may be not unfrequently seen in cases of old ulcers. A first, a second, and even a third cicatrization gives birth to a new structure that is resistant, and approaches in its characters to the normal condition of the part; but, if this act of reparation be repeated more frequently, the new-formed tissue becomes less and less completely organized: the ulcer is then said to be *atonic*, and under such circumstances it often remains incurable. The same remark is applicable to tuberculous formations, which occur in the lungs and other parts of the body."

He proceeds to point out certain analogies that may be traced between the imperfect or irregular developments—in other words, the Monstrosities—that not unfrequently occur in the human embryo, and the normal structures in some of the lower animals. We must confine our notice of this curious subject to the giving of one short extract.

"These mutilations or privations of organs are incompatible with the continuance of the independent and extra-uterine life of the fœtus; but, although this be quite true, let it not be forgotten that, despite the presence of such imperfections of organization, the creature was alive while it remained in the womb and was attached to the mother. Nay more, it may already have passed through several stages or phases of existence, and have perhaps more than completed its term of life as an Invertebrate being. Few physiologists seem to be aware that there is in these monstrous or deformed productions a scale, so to speak, of uterine viability (capability of life)—a circumstance of high philosophical importance, as it tends to show that there is a sort of independent existence on the part of the embryo, during its intra-uterine life. Thus, a fœtus that is destitute of an extremity only, will continue to live much longer within the womb, and thereby acquire a much higher degree of development, than another in which the heart or the brain is wanting."

In drawing these remarks to a close, we cannot but express a hope that they may excite the curiosity of some of our readers, and induce them to examine, more minutely for themselves, the highly interesting subject of Embryology in connection with that of Comparative Anatomy. No medical man can be said, in the present day, to be duly educated, if he has not acquired a tolerable knowledge of the latter science. How should it be otherwise, when we consider that Physiology can never be studied as it ought to be, without a constant reference to the organization of all classes of animals, from the simplest Zoophyte up to Man himself? He is but the last link of the chain that extends unbroken through the long series of zoological formations, and every part of which, however dissimilar and unlike one may *seem* to be from another, is constructed upon a simple harmonious and kindred plan. The marvellous discoveries that have been made, of late years, in Embryology, have added not a little to the interest of this subject, and have brought to light many such unexpected analogies and features of resemblance between forms that had been hitherto imagined to be most unlike, as almost to warrant the startling observations of our author, that "Human Organogeny is only a sort of transitionary Comparative Anatomy, as in its turn Comparative Anatomy is only the fixed and permanent condition of the different phases of Hu-

man Organogeny;" and that "Animals, in a *genetic* point of view, may be regarded as the permanent embryos of man."

In contemplating the succession of phases, or stages of development, which the human being is found to exhibit during its evolution within the womb—commencing in the most simple, and terminating in the most complex form, when it reaches its mature and complete formation—are we not almost involuntarily reminded of that most interesting discovery of modern Geology, viz: that just in proportion as we trace back the history of the earth in its physical structure, by examining the older and deeper strata of its formation, so, it would seem, the more simple and uncomplicated were the forms of animal beings then in existence? In the *transition rocks* we meet with the fossil remains of the very lowest tribes only; in the *secondary*, the remains are of animals of a higher order; and it is not until we reach the more recent deposits that the bones of the mammalia are ever found. Is it not possible to trace here a sort of parallelism between the *genesis* of animal beings during the successive epochs of the world's formation, and that of the embryo during its successive gradations of evolutionary development? The thought is but a passing fancy: and as such only we give it. But, whether there be any truth in the conjecture or not, of this we may rest assured, that the more that we search into the hidden workings of Nature, and make ourselves acquainted with her teeming wonders, the more clearly we shall perceive a unity of design and a simplicity of operation pervading all created things, and the more strongly shall we *feel* that they have all been fashioned and ordained, and that they are all upheld and continued, by one Almighty hand. It has been beautifully said that—

> The very law which moulds a tear,
> And bids it trickle from its source,
> That law preserves the Earth a sphere,
> And guides the planets in their course.

And so it is with the still greater marvels of the animated world. The same law, that presides over the formation of the humblest creeping thing, directs the development of him who walks the earth

> "With port sublime, and hopes beyond the skies."

All are alike framed on one simple and universal plan; all are created from a few, and the same simple elements; all perform similar functions; and all at length become resolved into the same component parts. Ought not the study of such a theme as that which we have been glancing at, while it exalts our admiration of the supreme wisdom and power of the Divine Architect, to serve at the same time to humiliate the pride and arrogance of man? In his body he is but a step removed from the brutes that perish; and, at one period of his existence, he has been but as they. His structure is not more wonderful than theirs; his physical powers are in many respects inferior. It is the spirit within that alone stamps him with pre-eminence, and lifts him so far above every other earthly thing "wherein the breath of life is." Admirably hath the poet expressed the

antithetic constitution of his nature—physical as well as moral—when he exclaims—

> How poor, how rich! how abject, how august!
> How complicate, how wonderful is Man!
> * * * * *
> An heir of glory! a frail child of dust!
> Helpless immortal! Insect infinite!
> A worm! a God!

A Treatise on the Use of the Sympathetic Nerve and its Ganglions, with their Influence on Various Diseases of the Abdominal and Pelvic Viscera. By *T. Proctor*, M.D 4to. pp. 48. Highley, 1844.

Without going so far as to say he has completely made out his case, we think the author of this interesting essay has brought forward facts and opinions in reference to the functions and morbid affections of that portion of the nervous system, concerning which the most vague, unsatisfactory, and contradictory doctrines have hitherto prevailed, that must command attention and will stimulate observation by directing it into a more definite channel. That additional and multiplied researches will be required before what he has advanced can take the position of an assured fact, he does not endeavour to conceal; and, having made what must at the very least be termed a most happy suggestion, he contents himself with pointing out a few corroborations which the phenomena of disease and the action of remedies seem to supply. If more extended observation confirms the view set forth, the practical consequences will ere long exhibit themselves abundantly enough.

The contemplation of the intimate anatomical relations of the sympathetic nerve with the arterial system, induces Dr. Proctor to conclude that its office consists in regulating the contractility of the blood-vessels. Nerves derived from other sources frequently accompany arteries for a long portion of their course, never, however, transmitting branches large or small to them, so that their juxta-position must be referred to some other cause than for affording facility for influencing their movements. The sympathetic, on the contrary, is emphatically the nerve of these vessels, enmeshing and penetrating them on every side, and following their minutest ramifications to their ultimate distribution. After describing the anatomical relations of the nerve, Dr. Proctor thus proceeds:—

"The nearest approach to a positive determination of its use that we can come to with our present limited knowledge is, that it is for the purpose of regulating the tonic contraction of the arterial system, and for *nothing else;* however, it is difficult to expound or afford the requisite proofs of this opinion, nor am I aware that public attention has at all been called to it. I venture, therefore, allowing this idea to form the basis of my investigation, to proceed to explain my present views upon the subject, first calling the reader's attention to the remarkable fact

with which the discoveries of Sir C. Bell has made us acquainted—that there is not a part of the human body that is not supplied with two or three sets of nerves, according to the simplicity or the intricacy of its functions: the excitors for sensibility, the motors for movement, and the respiratory system for the complicated purposes of respiration. When we see, by the discoveries of Dr. M. Hall, that we have a presiding and regulating power over all the sphincters and muscles of the body through the medulla oblongata and the medulla spinalis, and, in fact, that there is scarcely an organ in the human body that is not now *known to have* a moving and directing power; is it then probable, or even possible, that so important a system as the arterial should be without such a controlling and directing power? Acknowledging that it is not, as every one must necessarily do, and coupling this with the fact that there is a large and evidently important system of nerves exclusively surrounding, embracing, and running into the coats of the arterial system, of which we know little or nothing; and when we see the remarkable way in which anatomy bears out this opinion, I would venture to predict that so surely as anatomy led Sir C. Bell on step by step to his admirable, lucid, and conclusive arrangement of the other nervous systems, so surely does anatomy point out to us most distinctly the functions of *this* nervous system; and doubtless the time will arrive when it will be capable of demonstration: difficult as I confess it now appears to be, from its peculiar situation in the body, and from its apparent total want of functional connection with the other systems. It is singular that up to this period no author has sufficiently pointed out the remarkable difference in appearance and structure between the ganglia of the sympathetic and those of the spinal nerves. A single glance will be sufficient to show this very marked difference. It is seen in the sympathetic ganglion that the nerves appear to be more like elongations of the ganglion, each coming out clear and distinct, like so many tails, the ganglion itself being of an oblong shape and smooth. In the spinal ganglia the nerves are seen entering the globe-like body of a ganglion in bundles, leaving it in the same divided or fascicular form."

After alluding to the proofs derived from the experiments of Philip, Flourens, and others, of the non-dependence of the circulation upon the cerebro-spinal system, the author, in another part of his work, thus expresses himself.

"It is self-evident, then, that it is to the sympathetic (and that alone) that we must look for regulating the arterial system. And it will be observed that in all parts of the animal body where large and sudden supplies of blood are required, such as the heart, stomach, bowels, and organs of generation, we have the ganglionic or sympathetic system very fully developed, and, as far as I can judge, in ratio to the amount of blood supplied to the several organs: on the contrary, in some parts of the body, and in the extremities where the flow of blood is more regular and not subjected to those *sudden calls for large supplies of blood at irregular periods*, we find this nerve manifestly decreasing in size: and, indeed, as far as we can judge with the naked eye, ceasing altogether in some parts. Still I perfectly agree with Sir Charles Bell that it is distributed all over the body: but whether its influence is confined to regulating the small arteries which supply the coats of the vessels, or whether the same influence is continued by it over the whole circulating medium of the extremities and other parts that it manifestly has over the abdominal viscera, must, I fear, be left to a more enlarged inquiry."

An experiment is related which consisted in exposing the branch of the sympathetic nerve joining the ischiatic, and one of the arteries of the leg in a horse that had been killed by division of the medulla spinalis, and then connecting the nerve with the positive and the artery with the negative

pole of a galvanic battery. Pulsation in the artery was not only induced, but circulation in the minuter vessels was also excited. Similar experiments afterwards repeated gave corresponding results.

For anticipatory replies to some of the objections which may be raised to this explanation of the function of the nerve, we must refer to the work itself; and can only briefly advert to the practical and therapeutical applications. These, upon the very threshold of the inquiry, are of course few and somewhat conjectural; but, the true physiology and pathology of the nerve once established, they will multiply rapidly in number and certitude.

"If debility of its fine threads be a sufficient cause to throw into dissonant action the heart and arteries in some cases, should we not be inclined to abandon the practice which rests on depletion, counter-irritation, and treatment of this kind, and substitute in their place remedies and a regimen which may fortify and soothe the nerve? If dropsy be often caused by obstruction in the flow of blood through the portal system, and this debility of action in the portal veins depend upon an exhausted state of the sympathetic, shall we torment the patient, and perhaps increase the debility in question, by the use of hydragogues and diuretic medicine, which can only be intended to act on the *effect* of the original malady, leaving the *cause* unacted upon (at least beneficially so;) or, finally, knowing the inevitable tendency of the disorder of this nerve to engender serious organic maladies, shall we not watch for the first symptoms of its decline to restore its tone, or at all events retard the period of its loss of energy? But it will be asked, where are the means of restoring to a nerve the power it has lost? It may be replied, that although the restoration of a function utterly lost by time or long stimulation may be impossible, yet there is abundant evidence to show that other nerves have their functions restored in a direct mode by medicine. Take, for example, the agency of strychnine on paralysis of the spinal nerves, of carbonate of iron on neuralgia, and what evidence have we that all the beneficial effects of stimulants and tonics are not through the influence of this nerve?

"Nor can any one be ignorant that a regimen in which regularity and rest from mental emotions or exertions are insisted upon, has produced still more remarkable restorations. I do not doubt that many with myself will think that by similar means the impeded functions of the sympathetic have been restored.

"A very curious fact confirmatory of the views which I have taken upon this subject, is, I think, afforded by the remarkable analogy which will be seen to exist between the action of strychnia and of electric or galvanic influence upon functional disorders in some of the organs over which the sympathetic, and *that alone*, has control; not only as regards the kind of power acting upon the nerves, but also its influence on this particular system of nerves."

The outlines of several cases are given as confirmatory of the author's opinion of the *modus operandi* of strychnia; viz. that it influences the digestive, uterine, generative organs, &c. through the medium of the sympathetic, upon which it exerts a powerful direct action. Among these are examples of *impotence*, *amenorrhœa*, and *spasmodic asthma, combined with dyspepsia*. In nearly all, the effects of the medicine were rapid and decided in restoring the tone of the defective organ. In two of the cases of amenorrhœa which are related, galvanism acted in an equally beneficial manner. "It is by no means an unfrequent occurrence for menstruation to take place while the patient is being operated upon by galvanism; the same thing also occurs while under the influence of a single dose of strychnia."

A friend, Dr. Price, writing to the author concerning his experience in the use of strychnia in *habitual constipation*, after detailing a case of its beneficial influence, observes—

"I beg to add, that I have perceived the same effects in very many other instances, where the bowels have been induced to perform their functions daily, and these effects have continued for a longer or shorter period, requiring afterwards, in some instances, to take a little aperient medicine, as would be the case with persons not habitually costive. In a case, a few days ago, of a female whose bowels had been at all times constipated, I was compelled to repeat the strychnia. About four or five months before she had been very effectually relieved by this medicine: the necessity for this visit arose, by her own admission, from inattention to natural calls, and other circumstances. I should remark here that she has been married for several years, but she has never been pregnant; she never menstruated freely till after taking the strychnia. This is also a very frequent good effect of the administration of this medicine."

Even many of those who may not feel disposed to agree with the author as to the manner in which strychnia effects these beneficial changes in a class of affections often rebellious, will gladly avail themselves of the information he furnishes of its curative agency. Three plates illustrate some of the peculiarities of the distribution of the sympathetic.

ANATOMICAL SKETCHES AND DIAGRAMS, WITH DESCRIPTIONS AND REFERENCES. By *Thomas Wormald* and *Andrew Melville M'Whinnie*, Demonstrators of Anatomy at St. Bartholomew's Hospital. 4to. Highley, 1844.

THIS work is now complete, and is in every way calculated to fulfil its object—that of presenting a series of clear and simple Views of the more important parts of the Body—furnishing a useful guide to the Student in the dissecting-room, and, from its character as a Book on Regional Anatomy, will be equally acceptable to the Surgeon. The subjects have been judiciously chosen, and the lithographic drawings, which are mostly coloured, are executed with great fidelity.

Amongst the most useful of the Plates, we might select those containing views of the Orbit and of the 5th and 7th Cerebral Nerves—those of the Neck in the order convenient for dissection—of this region the plans will be found very complete and instructive.

The views of the Chest and Abdomen are new and original—in connexion with the Vena Cava and Vena Portæ, we have illustrations of the Fœtal Circulation.

The Axilla, Bend of the Elbow-joint, and Groin—the Gluteal and Popliteal Regions are displayed, and recall to mind the relative anatomy of these parts.

We can most confidently recommend this Work, which, from its moderate expense, will be within reach of every Student.

A Manual of Elementary Chemistry, Theoretical and Practical. By *George Fownes*, Ph. D. Chemical Lecturer in the Middlesex Hospital Medical School, and to the Pharmaceutical Society of Great Britain. Pp. 566. London, 1844.

Numerous and useful as are the works extant on the science of chemistry, we are nevertheless prepared to admit that the author of this publication has made a valuable addition to them, by offering the student and those in general who desire to obtain information, an accurate compendium of the state of chemical science ; which is, moreover, well illustrated by appropriate and neatly-executed wood-engravings.

At the commencement of his Preface the author has so clearly and appositely expressed the view which he entertained in compiling his work, that we cannot do better than give his own words.

> " The design of the present volume is to offer to the student commencing the subject of Chemistry, in a compact and inexpensive, but, it is hoped, not unintelligible form, an outline of the general principles of that science, and a history of the more important among the very numerous bodies which Chemical investigations have made known to us. The work has no pretensions to be considered a complete treatise on the subject, but it is intended to serve as an introduction to the larger and more comprehensive works in our own language and in those of the Continent."

Dr. Fownes has divided his work into four Parts—the first treats of Physics, including *Density and Specific Gravity ; The Physical Constitution of the Atmosphere, and of Gases in general*, and *Heat, Light, Electricity*, and *Magnetism ;* the second Part treats of *Non-metallic Elements ;* the third, of *Metals ;* and the fourth, of *Organic Chemistry ;* this last appears to be the favourite portion of the author's subject, for of 540 pages of which his work consists, 200 are occupied by it alone ; we indeed are of opinion that, considering the work as intended to be elementary, the author would have done better to have dedicated some portion of the space which he has bestowed upon organic chemistry to a more full consideration of chemical affinity, and the circumstances under which it is excited and exerted, and those by which it is accelerated, impeded, or prevented.

Unless we mistake, no mention is made of cohesion in general, or of the effect which it has of controlling the chemical action of bodies upon each other ; the chemical agency of light and electricity, might also, we think, have been advantageously considered more at length.

When electricity, the last of the imponderable bodies, has been treated of, (and of this portion of the work we have no complaint to offer,) the author naturally proceeds to the enumeration of the elementary ponderable bodies, which he subdivides into the three classes of *non-metallic, intermediate*, and *metals*. It appears to us that there was no necessity for, nor any advantage gained by, introducing the second sub-division ; it includes phosphorus, arsenic, and tellurium ; why the first should not be considered as perfectly non-metallic as sulphur, or why, if antimony be a metal, arsenic is not, we cannot discover. With respect to tellurium, indeed, we observe that Dr. Fownes has adopted an antiquated term in

treating of it at p. 310—he calls it "this metal or semi-metal." We do not find that the author has stated any reasons for his arrangement, though we are far from asserting that he could not have assigned satisfactory ones.

The substance first treated of in detail is Oxygen, and as we do not know that we can give a more fair specimen of Dr. Fownes's manner of treating of the subjects which he has to describe, than by quoting this part of his work, we shall give a considerable portion of his statements with respect to oxygen. We shall take the liberty of appending to it a few remarks, which we trust will be received with the same friendly spirit as that by which they are dictated.

"Oxygen was discovered in the year 1774, by Scheele, in Sweden, and Dr. Priestley, in England, independently of each other, and described under the terms *empyreal air* and *vital air*. The name oxygen* was given to it by Lavoisier some time afterwards. Oxygen exists in a free and uncombined state in the atmosphere, mingled with another gaseous body, nitrogen; no direct means exist, however, for separating it from the latter, and accordingly, it is always obtained for purposes of experiment by decomposing certain of its compounds, which are very numerous.

"The red oxide of mercury, or *red precipitate* of the old writers, may be employed with this view. In this substance the attraction which holds together the mercury and the oxygen is so feeble that simple exposure to heat suffices to bring about decomposition. The red precipitate is placed in a short tube of hard glass, to which is fitted a perforated cork, furnished with a piece of narrow glass tube, bent as in the figure. The heat of a spirit-lamp being applied to the substance, decomposition speedily commences, globules of metallic mercury collect in the cool part of the wide tube, which answers the purpose of a retort, while gas issues in considerable quantity from the apparatus. This gas is collected and examined by the aid of the pneumatic trough, which consists of a vessel of water provided with a shelf, upon which stand the jars or bottles destined to receive the gas, filled with water and inverted. By keeping the level of the liquid above the mouth of the jar, the water is retained in the latter by the pressure of the atmosphere, and entrance of air prevented. When brought over the extremity of the gas-delivering tub, the bubbles of gas arising through the water collect in the upper part of the jar and displace the liquid. As soon as one jar is filled, it may be removed, still keeping its mouth below the water-level, and another substituted.

"The experiment described is more instructive as an excellent case of the resolution by simple means of a compound body into its constituents, than valuable as a source of oxygen gas. A better and more economical method is to expose to heat in a retort, or flask furnished with a bent tube, a portion of the salt called chlorate of potash. A common Florence flask serves perfectly well, the heat of a spirit lamp being sufficient. The salt melts and decomposes with ebullition, yielding a very large quantity of pure oxygen gas, which may be collected in the way above described. The white saline residue in the flask is chloride of potassium. This plan, which is very easy of execution, is always adopted when very pure gas is required for analytical purposes.

"A third method, very good when perfect purity is not demanded, is to heat to redness in an iron retort or gun-barrel, the black oxide of manganese of commerce, which under these circumstances suffers decomposition, although not to the extent manifest in the red precipitate.

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* "From ὀξὺς, acid, and γεννάω, I give rise to."

"If a little of the black oxide of manganese be finely powdered and mixed with chlorate of potash, and this mixture heated in a flask or retort by a lamp, oxygen will be disengaged with the utmost facility, and at a far lower temperature than when the chlorate alone is used. All the oxygen comes from the chlorate, the manganese remaining quite unaltered. The materials should be well dried in a capsule before their introduction into the flask. This experiment affords an instance of an effect by no means rare, in which a body seems to act by its mere presence, without taking any obvious part in the change brought about." 93.

In his brief account of the discovery of oxygen, Dr. Fownes, quite unintentionally, we doubt not, has done some injustice to Dr. Priestley. It would seem, from the mode of statement, and Scheele's name being placed before that of Priestley, that both of them had made the discovery in the same year, and Scheele the earlier of the two. That Dr. Priestley discovered oxygen in 1774, is universally admitted, for he exhibited its properties to Lavoisier in that year, and in 1775 appeared his work containing an account of the mode in which he procured it. Now, Scheele's work on Air and Fire, containing the account of his discovery of the gas, was not published till 1777. Again, Dr. Priestley described it under the name of *diphlogisticated air*, while it was Scheele who called it *empyreal air*, and Condorcet who named it *vital air*.

The author has noticed the bad conducting power of water with regard to electricity, but does not mention its bad conduction of heat under the head of water, though allusion is made to it when treating of conduction; this curious subject might, we think, have been advantageously dwelt upon a little more at length.

There is an observation at p. 108, which we suspect conveys more than the author could have meant; he observes, that "the ocean is the great recipient of the saline matter carried down by the rivers, which drain the land; hence the vast accumulation of salts." This language conveys to us the idea that the author supposes the saline contents of the sea to have originated from the saline matter carried down by the rivers, an opinion, which we presume he will hardly maintain, though it undoubtedly contributes to increase the quantity.

With respect to nitric acid, we may observe that Dr. Fownes has stated the composition of nitric acid of 1·5 density, incorrectly at 54·06 real acid and 9 water. Dr. Ure's experiments show very nearly that it consists of one equivalent of nitric acid 54 and one and a half of water 13·5; and we may here remark that the author, notwithstanding the evidence which has recently been adduced in favour of nitrogen having 14 for its atomic weight, represents it by 14·06. A few mistakes of the nature which we have just pointed out, could hardly fail to occur in a work containing so many facts as one on chemistry necessarily does; we doubt not, however, that before a second edition is called for, the author will have carefully revised what he has written, and corrected such slight mistakes as we have noticed.

To that part of the subject which relates to organic chemistry, Dr. Fownes has evidently paid much and minute attention. We find it difficult to select any particular portion for approval, but we may remark, that the subject of ether has been very ably treated of, and that the facts relat-

ing to etherial compounds are compressed with clearness and accuracy into a very small compass.

After what we have stated of this work, our readers will not be surprised that it has our hearty commendation, and that, in our opinion, it is calculated, and at a trifling expense, to spread the doctrines of the intricate science which it so clearly explains

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The Seven Books of Paulus Ægineta. Translated from the Greek; with a Commentary embracing a complete View of the Knowledge possessed by the Greeks, Romans, and Arabians, on all Subjects connected with Medicine and Surgery. By *Francis Adams*. In Three Volumes. Vol. 1, pp. 683. Sydenham Society, 1844.

To those who wish to ascertain what the ancients knew of medicine and surgery, but who have neither time nor power to wade through the numerous and ponderous tomes of antiquity, these volumes will prove a most welcome, perhaps valuable, treasure. We say *perhaps*—for, having explored a considerable number of the ancient writers, from Hippocrates downwards, many years ago, we have formed opinions of our own on the utility of that branch of study. Mr. Adams quotes a curious passage from Rhases, the Arabian, which we shall here notice. "The number of authors is not small by whose labours the art has attained its present growth; and yet one may hope to master the monuments of their industry within the space of a few years. Let us suppose that, in the course of a thousand years, a thousand authors had made improvements in the profession; and then a person who has diligently studied their works may improve his mind as much in knowledge as if he had devoted a thousand years to the study of medicine."—*Pref.* To the truth of this passage we entirely object. It is not only untrue, but it is eminently absurd. Is not the study of the old medical writings the study of medicine? He must therefore have meant the thousand years' study of medicine to include the *practice* also. But we fearlessly maintain that the great mass of medical practitioners in this and in every other country, would lose a vast deal of valuable time in the perusal of the ancient medical authors—and that the said time would be far more profitably spent in the acquisition of medical knowledge at the bed-side of sickness, and in attendance on modern lectures. The life of a man is three-score years and ten. Out of these, nearly twenty years are devoted to elementary instruction—five or six to professional studies, and the remainder to practice. To attempt a perusal of the Ancients during the five or six years of medical study, would be suicide—and in the intervals of practice, the physician-surgeon, or general practitioner, can rarely do more than keep his information up to the level of advancing science. The pure physician, indeed, while waiting on practice, or rather on Providence, may study the fathers of physic, by

whiling away the time that hangs heavily on his hands, in learned leisure; though we are thoroughly convinced that such leisure might be better employed in modern investigation. The fact is, that nine-tenths of ancient wisdom, as transmitted by the Fathers, are downright errors—while the one-tenth of truth may be found at home in any good elementary work of our own times.

We are aware that we shall incur the displeasure of the "LAUDATORES TEMPORIS ACTI," and be considered as Goths and Vandals—or Utilitarians; but we care little for these censures. Our observations apply to the study of the medical fathers in their original language and full extent. The abridgement or analysis before us, which will not require more than a few weeks for perusal, has our entire approbation, and is strongly recommended. It is purged of mountains of chaff, though still containing a great deal more than solid grain. It will convey a good idea of what our forefathers of Asia, Greece, Italy, Egypt, &c., knew—and what they did not know. The *latter* will strike the modern practitioner much more forcibly than the *former*. It is proper to state, that the work of Paulus Ægineta is made the text, or rather the peg, on which the author has hung the doctrines and practices of the ancient fathers generally—a plan which required prodigious labour on his own part, and saves a world of toil and time on the part of his readers. PAULUS himself, indeed, was only a COMPILER, according to his own confession, having "set down little of his own:" but he was, on that very account, the very best author that Mr. Adams could have selected for his purpose. We shall now exhibit a few specimens of the wisdom of the Ancients.

1. *Complaints of Pregnancy.*—Redundance of crudities—*continued* vomiting, salivation, heart-burn, &c. *Remedies*—foot exercise—yellow wines that are fragrant, and five years old. *Medicines*—knot-grass—dill—Pontic-root, &c.

2. *Siriasis.*—Inflammation about the brain and its membranes, attended with hollowness of the open of the head and eyes—paleness and dryness of the body. "It is relieved by an application of the red of an egg with oil of roses to the open of the head, in the form of compress." P. 16.

3. *Dimness of Sight.*—"In order to avoid dimness of sight, when they plunge into cold water, people ought to open their eyes wide, for thereby the strength of their eyes will be much improved. They ought also to be careful not to hurt them by reading. Let them also avoid wine that is thick and sweet, such articles of food as ascend upwards, whatever is of difficult digestion, and engenders crude and thick humours, the herb rocket, leeks, and everything whose pungency ascends upwards. Let them also avoid reclining long in a supine position, cold, winds blowing direct in the face, smoke and dust; and pour daily into the eyes an infusion prepared thus: for a month and a day, put green fennels into an earthen vessel smeared with pitch on the outside, and pour in rain water, and then taking out the fennels, keep the water laid up for use." 41.

4. *Digestion.*—"Actuarius says, 'I am of opinion, that there are four species of concoction which are performed in different parts of the body: the first in the stomach; the second in the vena ramalis (vena portæ?), meseraic veins, and

concave part of the liver; the third in the convex part of the liver and veins proceeding from it; and the fourth, consisting of fabrication or assimilation, which takes place in the extreme parts of the body.'" 91.

5. *Food.*—The ancients, like the moderns, attached considerable importance to diet. They had three or four meals daily. First, the breakfast, *jentaculum*—second, *prandium*, or dinner, about three o'clock—third, *merenda*, the nature of which is not well defined—fourth, *cœna*, or supper, about eight o'clock—and lastly, COMMISSATIO, a kind of jollification after the cœna or great meal. "According to Athenæus, a good physician ought to be a good cook. (Deipnos. vii.) Upon the authority of Daphnus, the Ephesian physician, he decides that night is the most proper time for taking the supper or principal meal, because, says he, the moon promotes putrescency, and digestion is a species of putrefaction." 119.

6. *Flesh.*—Among quadrupeds, swine's flesh is more nourishing than any other food, "because it is most nearly allied to the human, in taste and smell; but the nourishment derived from it is viscid and imperspirable." That from sheep is excrementitious, and "*supplies bad juices.*"

"That from goats is acrid, and has bad juices. But the worst of all is the flesh of the buck-goat as to the quality of its juices and to digestion. That of oxen forms melancholic humours; that of hares has thick juices, but less so than that of sheep and oxen. That of roes is hard and of difficult digestion. In general, the flesh of young beasts is more humid, more tender, and more digestible than that of the aged; of gelded animals than of those having testicles; and of the well-fed than of the lean." 145.

It would be difficult to compress more error into so small a space than the above passage conveys.

7. *Milk.*—When digested, is nutritive, but it is injurious to the gums and teeth. It also produces head-ache, flatulence, hypochondria, and engenders stone in the kidneys.

8. *Wine.*—The ancients varied much in their opinions respecting this celebrated beverage. Its moderate use, however, they almost all recommend, "as resuscitating the natural heat within us, improving digestion, and forming good blood." Immoderate drinking is condemned. The following passage is curious.

"When one has drunk largely, it is not proper to take much of any other food; but while drinking, one should eat boiled cabbage, and taste some sweet-meat, particularly almonds. These things relieve headache, and are not difficult to vomit. It is also very proper to take the infusion of wormwood before drinking, for of all things it is the best preservative from surfeit. If one experience any painful effects from wine, one should drink cold water, and the next day again the infusion of wormwood: and by using exercise, friction, the bath, and restricted food, in this way get restored to health." 172.

9. *Fever.*—This disease was considered by the ancients as a preternatural increase of animal heat, diffused from the heart to all parts of the body, through the medium of the arteries. The first thing to be considered is

the fatality or non-fatality of the fever—next, whether it will be acute or chronic—and thirdly, whether it will come or not to a crisis. The fatal symptoms are a "deathlike countenance—sharp nose—hollow eyes, and other symptoms described by Hippocrates—intolerance of light—one eye less than the other—white of eye appearing red or black—grinding of teeth—delirium—floccitatio, &c." Undoubtedly it requires no ghost or prophet to tell that these are bad symptoms when the fever has progressed to this state; but how is the prognosis to be formed at the *beginning* of the fever? As for the other two questions, they are answered in such a vague or erroneous manner as to require no comment.

10. *The Pulse.*—"The pulse is a movement of the heart and arteries, taking place by a diastole and systole. Its object is twofold; for, by the diastole, which is, as it were, an unfolding and expansion of the artery, the cold air enters, ventilating and resuscitating the animal vigour, and hence the formation of the vital spirits; and by the systole, which is, as it were, a falling down and contraction of the circumference of the artery towards the centre, the evacuation of the fuliginous superfluities is effected." 202.

11. *Cure of Tertian Fever.*—"In the true tertian fever, as arising from yellow bile, we must dilute and cool—evacuate the defluxions upon the stomach by emetics—and downwards by the bowels, carrying them off by perspiration and urine." When symptoms of concoction appear, wormwood may be given.

12. *Love-Sickness.*—"It will not be out of place here to join love to the affections of the brain, since it consists of certain cares. For care is a passion of the soul occasioned by the reason's being in a state of laborious emotion. The following symptoms attend lovers: Their eyes are hollow, and do not shed tears, but appear as if overflowing with gladness, their eyelids move rapidly; and even, when none of the other parts of the body are affected, these parts are always so affected in lovers. There is no pulse peculiar to lovers, as some have supposed, but it is the same as that of persons labouring under care. When they call to recollection the beloved object, either from seeing or hearing, and more especially if this occur suddenly, then the pulse undergoes a change from the disorder of the soul, and, therefore, it does not preserve its natural equability or order. Such persons, therefore, being desponding and sleepless, some physicians, mistaking their affection, have wasted them by prohibiting baths, and enjoining quietude and a spare diet; but wiser ones, recognising the lover, direct his attention to baths, the drinking of wine, gestation, spectacles, and amusing stories."

13. *Spleen.*—"The use of the spleen being to attract from the liver the melancholic humour, which is, as it were, the lees of the blood, if its attractive power be weakened, or the passage obstructed by which this was formerly attracted, the black jaundice is formed, blood in an unpurified state being distributed over the whole body; and if there be weight and distention about the spleen, or if there be also pain, obstruction is indicated; but if there be none of these, it is weakness of the attractive power. But vomiting of black bile taking place without fever, or any other symptom of malignity, indicates a weakness of the retentive faculty of the spleen. A weakness of the expulsive faculty will bring on anorexia, the melancholic superfluity being no longer carried to the orifice of the stomach and exciting the appetite." 577.

Reader! have you enough of these specimens of ancient medical know-

ledge? If so, shut the book, and if a student, go to the hospital, the lecture-room, and the dissecting-room, for information, rather than to Galen and Paulus Ægineta. If you are in actual practice, study diseases for yourself at the bedside of sickness, and keep up to the level of the swelling tide of knowledge that everywhere flows around you. If, however, you prefer the imperfect—too often absurd, doctrines and practices of the Arabian, Greek, and Roman physicians, you will study their writings by day and by night, till you have earned for yourself the reputation of being a learned veteran of—THE OLD SCHOOL.

OUTLINES OF MILITARY SURGERY. By Sir *George Ballingall*, M.D. F.R.S.E. Third Edition. 1844.

RECUEIL DE MEMOIRES DE MEDICINE, DE CHIRURGIE, ET DE PHARMACIE MILITAIRES. Vol. 56, Paris, 1844.

A Collection of Memoirs on Military Surgery, Medicine and Pharmacy. Vol. 56.

A MEDICAL work reaching its third edition can require little notice or recommendation upon the part of the Reviewer; but we may observe that, we think its value would have been enhanced if the first division, relating to what may be termed Military Hygiene, had formed a larger proportionate share of its contents. This, however, could only be accomplished by much enlarging the size of the book, or by trenching upon the purely surgical portion, which the author considers as specially demanding his attention.

"So long as this course stands alone, the only one of its kind delivered in the medical schools of the united kingdom, so long it can only be patronized and encouraged as a substitute for part of the surgical attendance enjoined by the several colleges: and hence I feel myself bound, in justice to my pupils, to enlarge upon the surgical department. Again, I find that this is the department of the course which proves most interesting to that important part of my audience consisting of gentlemen returning from foreign service, to refresh their memories, or to renovate their knowledge at the schools of medicine. * * * * * * * * * Without at all underrating the importance of those diseases more strictly within the province of the physician, I cannot avoid expressing my fears, that in a period of long protracted peace, there is some risk of the medical officers of the army overlooking the importance of the surgical department of their profession."

That the army or naval medical officer should be made fully acquainted with every surgical duty which he, beyond any of the profession, is most likely to be called upon to fulfil, is too obvious to require farther remark; but it is no less true that this forms but a portion, and even a limited portion, of what should be expected from him, and is by far the most easy of attainment at the ordinary courses of surgical instruction at our schools. Such knowledge will, indeed, prove invaluable upon the field of battle: and it is a matter of sincere congratulation that the gross ignorance which disgraced the lower ranks of medical officers of both the French and British

armies at the commencement of the late wars, can never be again witnessed. But do not the histories of all campaigns and naval expeditions, and the defective health and large mortality of our soldiers and seamen even during a period of profound peace, too truly indicate that sources of destruction far more potent and more constant in their operation than the battle-field are in existence? Formidable as these evils are, they are still very much diminished, for even the condition of the warrior has participated in the general progress of improvement. But such improvement has only arisen from the diffusion of more sound principles of hygienic treatment, and can only be augmented by their still farther dissemination. Where is the young medical officer to seek for the necessary information upon this subject, if not at the hands of his experienced teachers of military medicine? for it is obvious that, at the ordinary courses of the schools, none such can be supplied. It is true that we possess a great number of works which incidentally convey most valuable information upon this head, and much of modern improvement is due to their publication: but we have no work treating Military Hygiene as a substantive subject, although, from its great national importance, it is worthy of the employment of the highest talent and most extensive experience. We sincerely hope the Head of the Army Medical Department has not abandoned the intention the author states he once entertained of producing such a one.

In truth there is no member of society, placed above destitution, whose condition is more worthy of consideration and commiseration than that of the common soldier. Frequently entrapped into the service of the public at an unwary moment, he discovers, when too late, that he has contracted an interminable bondage with a hard task-master. Neither emancipation nor advancement stimulates and rewards good conduct, while the smallest delinquencies are visited by punishments determined by an arbitrary system of laws, and too often inflicted with most injudicious severity. It might be expected that the complete abrogation of the moral judgment, and the conversion of the man into an intelligent machine, which military discipline exacts, would, at least, be compensated for by a due provision for every physical comfort, as is seen to be the case in some of the other more avowed forms of slavery. With the soldier it is not so; for, whether we regard his clothing, his diet, his abodes, his recreations, his nightly rest, the due alternations of moderate employments with proper intervals of repose, or a variety of other circumstances, we see cause to acknowledge the necessity of great meliorations before his hygienic condition can be considered satisfactory. Many of the inconveniences of a military life are indeed inseparable from it during the period of war, although even then susceptible of great mitigation: but the extent to which they are allowed to continue during peace is lamentable. What are the results of the conjoined operation of the various circumstances unfavourably influencing the condition of the soldier? A large proportion of premature deaths and suicides, frequent attempts at desertion, an addiction beyond all other classes to intoxicating liquors, and the generation of such a host of fictitious maladies, that no small share of the duties of the military surgeon, aided by a now distinct branch of medical literature, consists in their detection.

We proceed to notice a few of the observations made by Sir George Ballingall upon this subject.

Diet.—The importance of a wholesome and abundant diet, as a means of preservation of the health of the soldier, is now almost universally acknowledged. Dr. Jackson, however, believes that a frugal fare has usually been that of the conqueror, and a rich and luxurious one that of the conquered.

"In his last work, on the 'Formation, Discipline, and Economy of Armies,' Dr. Jackson has adduced much ingenious argument in support of his views of this subject; and he concludes by observing, that luxurious living places the military character on the brink of destruction; 'for,' says he, 'if there be anything like correct observation among men, it may be confidently asserted, that, if high living be the life of the gentleman, it is the death of the soldier.' It is obvious, however, that such observations as the foregoing apply only to the luxuries occasionally indulged in by the higher ranks. They can only be addressed with propriety to the officers—to the educated and reflecting part of the army—and habits of abstinence are so little congenial to the disposition of the English soldier, that he will never practise them when he can do otherwise. My views of the disadvantages of an insufficient diet are, I find, fully borne out by the recent experience of Mr. Alcock of the British Legion, who, in a letter to me, observes that his men, at Vittoria, were literally starved upon their rations, nominally a pound and a half of bread, and a pound of meat; but this, when served to the soldier, after the peculations, and diminutions from bone and skin, was often not more than four or six ounces of solid meat. 'This,' says he, 'is not sufficient, and formed a very prominent cause of a startling mortality.'" 37.

Where practicable, daily rations are to be preferred as preventing the waste and gluttony which sometimes are present when several days' are delivered out at once. In a letter to Sir James M'Grigor, the Duke of Wellington states that rations were invariably delivered daily in the Peninsula; and that the British soldier carried but three days' bread, while the Portuguese carried six, and the French fifteen days'. Almost all observers agree in the importance they attach to the introduction of tea or coffee for the soldiers' breakfast. Their use seems often prophylactic in cases of exposure to malaria, night air, &c. The benefits resulting from substituting these drinks for spirits in both Army and Navy are acknowledged on all hands. "Coffee," says M. Finot, in an article to which we shall presently advert, "now received in the berry and ground as wanted, forms the best of drinks for the French soldier in Africa. The advantages which have attended its replacing the former distributions of brandy, are, we believe, now definitively agreed upon."

Clothing.—We do not think the author has sufficiently exposed the defective character of this. To us it seems that it would be difficult to contrive more unsuitable habiliments than those of the soldier, which restrain by their tightness free muscular action, rendering the occasional active exercises painful and dangerous, and by their flimsy texture afford an insufficient protection against the inclemencies of the weather. White trousers may look very nice upon parade, and please the eye of the commanding officer, but, in this and other cold and inclement climates, should

never be employed, especially when it is considered that it is impossible for the soldier to keep them sufficiently clean without the use of wet pipe-clay. Under-clothing of every description, both waistcoats and drawers, is also far too much neglected, although instances of the prevention and removal of disease by its adoption are exceedingly numerous. When we consider the vicissitudes of weather a soldier is exposed to, his alternations of active exercise and perfect inactivity, and the broken description of rest he obtains, it seems evident that he is very insufficiently clad, and that above all things he should be furnished with a better supply of flannel.

Exercises.—The author thinks that these require great attention to be paid to them by the officers, agreeing with Sir John Pringle, that "although a soldier is occasionally liable to great fatigue, the most frequent error of people of that class, if left to themselves, would be on the side of rest." The most eligible rate for marching in all climates is from three to three and a half miles per hour.

"I have been much pleased to find my own views on this point strongly confirmed by a recent authority, Dr. Kennedy, of the Bombay army, who, in his interesting 'Campaign of the Army of the Indus,' observes, that 'when the soldier has from 50 to 60 pounds weight to carry, a distance of 12 or 14 miles to march, and a solar temperature above 100° to bake in, the shorter the time he is about it, the better. It is in my opinion an erroneous practice, as was the custom during my service in India, from fear of exposure to the sun, to move off the troops from the ground at two or three o'clock in the morning, sometimes even earlier. Their sleep was thus broken; and the march, accomplished in the dark, frequently over bad roads or no roads at all, was necessarily protracted, was attended with great additional fatigue, and not without risk to the limbs of individuals. An hour's more sleep, and an hour's more daylight, even at the expense of an hour's more sun, was the maxim which I endeavoured to inculcate." 46.

Accommodation of Troops.—We cannot compress the few remarks the author makes upon the construction of camps. He particularly insists that, when these prove unhealthy, other localities should at once be chosen, rather than attempts be made, which usually fail, at remedying the evil. In the construction and regulation of *barracks*, means for *thorough ventilation* and perfect *cleanliness* should be carefully provided for. "The class of society from which soldiers and their wives are taken have an incorrigible aversion to the free circulation of air, a circulation which is rendered more necessary for them than for the higher ranks, in consequence of their less minute attention to personal cleanliness." Dr. Reid's Illustrations of Ventilation, noticed in a recent number, supply us with numerous examples of the defective condition of shipping as regards ventilation. Sir George Ballingall describes an easy and effectual mode of ventilating barracks, by which the currents of air so detrimental to health and comfort are avoided. Dry-scrubbing the floors has been advantageously substituted in numerous instances for the former too frequent washings. This cannot always be done.

"In warm climates, where vermin, and particularly fleas, are abundant, frequent washing is perhaps a necessary resource. Mr. Alcock tells me, that in

the large hospital at San Telmo, containing 600 beds, he had each division scrubbed with water every morning at day-break during the summer months, to the manifest comfort of the patients, who were thus kept free from vermin, greater coolness and cleanliness were obtained, and no bad result was observed. By the general introduction of iron bedsteads into barracks, cleanliness has been essentially promoted, and ventilation improved; for those cumbersome wooden bedsteads formerly in use, not only obstructed the circulation of air, but even materially diminished the cubical bulk of it contained in a room."

The importance of *whitewashing* hospitals and other crowded receptacles is now generally acknowledged, and the author deplores the unnecessary obstacles and delays which often prevent its execution, as well as the imperfect manner in which it is usually performed. We have often regretted the remissness of parochial authorities in applying this useful preventive of infection to our wretched alleys and courts; but the neglect in the case of barracks, military hospitals, &c., where all the appliances and plenty of hands may be easily furnished, is far more culpable.

Proportion of Sick in Armies.—This may be much diminished by careful attention to the various circumstances mentioned. As already observed, those who fall in battle constitute but a small portion of the total mortality. Sir D. Stewart states, "that the 92d regiment lost more officers and men in four months from the climate of Jamaica, than by the hand of an enemy in an active war of 22 years, in the progress of which it was 26 times in battle." After alluding to the large proportion of sick reported by Pringle, in the campaigns of the Low Countries, the author observes—

"To compare this with what has recently happened in another quarter of the world, I may notice the statement made regarding the sickness in the Bombay division of the Army of the Indus. From 1st Nov. 1838 to 31st Dec. 1839, the number treated was, Europeans and Natives, 11,689, and the deaths 408, which, compared with the strength, sufficiently indicates the hardships endured, and the efficiency of the hospital establishments. From Col. Tulloch's statistical statements it is inferred that soldiers in the United Kingdom are under medical treatment once in 13 months; in the West Indies twice within that period. In this country 1 case in 67 proves fatal, and in the West Indies 1 in 24."

Mr. Edmonds states, from returns in the Adjutant-General's Office, that in the Peninsular Army, averaging 64,227, the annual ratio of mortality, in the years 1810-13, was 10 per cent. officers, 16 per cent. men, and that during this period there were constantly 22¼ per cent. sick. Vaidy, in his article "*Hygiene Militaire*" in the "*Dictionnaire des Sciences Medicales,*" states that, under the most favourable circumstances, an army will furnish about 5 per cent. of sick. During a campaign, not less than 10 per cent. must be calculated; and in the event of reverses or other untoward circumstances, this becomes immensely increased. As an example of what may be effected by able medical superintendence, the author cites the following incident of the Peninsular war.

"During the ten months from the siege of Burgos to the battle of Vittoria, inclusive, the total number of sick and wounded which passed through the hospitals was 95,348. By the unremitting exertions of Sir J. M'Grigor and the medical staff under his orders, the army took the field, preparatory to the battle

with a sick list under 5,000. For twenty successive days it marched towards the enemy, and in less than one month after it had defeated him, mustered within thirty men as strong as before the action, and this too without reinforcements from England, the ranks having been recruited by convalescents."

There are several interesting observations upon the construction and management of Military Hospitals, and the most approved modes of Transportation of the sick and wounded.

The other work noticed at the head of this article is the last volume of a series of papers upon Military Medicine, contributed by the medical officers of the French Army. Our neighbours, as is well known, have long been ardent cultivators in this field, and the labours of some of their most eminent observers are scattered over the half-hundred volumes of this Collection which have appeared. The principal paper in the present volume relates to

THE MEDICAL HISTORY OF ALGERIA,

the acquisition of materials for the illustration of which, has long been an object of ardent desire of the Military Council of Health. This has been responded to with alacrity by the medical officers of the African army: and documents illustrating the topography of the various localities, and the nature of the different diseases which prevail in them, are continually arriving. The progress of the French soldier is represented as being constantly attended with an improved sanatary condition of the portions of the country subjected by his arms, and one important fact is deduced from the various reports.

"A fact beyond all doubt at present is, that the climate of Algeria is healthy, and that the disastrous epidemics which have thinned our armies are due to local causes susceptible of removal."

The present contribution is an account, by M. Finot, of the Military Hospital at Blidah, in 1842, during which he treated upwards of 8,000 patients there. It is a most interesting document, amply illustrated with tabular views of results, and we regret that our space will allow only of allusion to some few of the observations it contains.

The conquered Arabs, in their ignorance, reject the benefits which medicine would confer upon them.

"The apathy of Mussulmen during epidemics is well known. Nothing is more common than to see men and children, having small-pox pustules in full suppuration, lying in the mud in the streets of Blidah, and in the roads of its vicinity, scarcely covered by a few wretched rags. They refuse the benefits of vaccination, and it is only by deceiving them that we have been able to subject a few to its influence. Many of the numerous diseases arise from the frequent ablutions which their religion necessitates. To this cause, and to the habit of sleeping in the open air, must be attributed the very frequent occurrence of pulmonic affections among the Arabs, compared to the Europeans resident at Blidah."

When the more intelligent of the Arabs become affected with *small-pox*,

they adopt a practice which they state diminishes the deformity, duration, and danger of the disease. As soon as the eruption commences, every part of the body is covered with pledgets previously macerated in oil. When the period of suppuration arrives, the patient is washed, cleaned, and again well greased.

Treating of Syphilis, M. Finot mentions the curious manners of the country as respects *prostitution.*

"This is not as with us a vice and object of detestation. It is a peculiar occupation, which a woman enters or leaves just as she feels disposed. Prostitutes are under the protection of the Mezouar, a kind of public officer somewhat resembling a French Commissioner of Police. He exercisees over them an unlimited authority, which he often abuses for the extortion of money; but he will not allow any one else to offer the slightest violence to his *protegées.* When a woman suffers injury at the hands of her husband or her friends, she flies to the Mezouar, whence she can only be removed on the payment of a certain sum agreed upon among the parties. If this is not effected, she becomes a prostitute, or, as it is called here, a 'free woman.' She now acquires a right to appear in the streets with her face uncovered, and takes a part in all festivities, without any one, even her own mother, venturing to interfere with her. When she desires to re-enter her former mode of life, or to marry, she presents herself before the *Cadi*, with two witnesses. There she declares she wishes to live in future like a good Mussulman. A copy of her declaration is supplied her, and no one possesses any right of inquiring as to her former mode of life. We know at least a dozen such girls who have thus quitted a life of debauchery, and who have married Moors well-to-do in the world. The Mussulmen do not look upon these prostitutes as degraded beings, since they allow them to go into the best society, and to frequent the baths with their own wives. They believe them foolish, or as actuated by an evil spirit."

Of 37 of these women who were affected with syphilis at the time of writing, the author states 32 were married, and 5 only single women. Thirty of the number declared they were driven to prostitution by poverty or ill-treatment.

Two Medical Seasons.—The number of admissions from July to December singularly preponderated over those from January to July. The periodical increase is very evident when stated in *trimestres* (by three months). Thus, in the *Plain of Mitidja*, the patients increased thus: 1st trimestre, 1401; 2d, 2105; 3d, 4314; 4th, 2058—July, August, and September being the endemo-epidemial months *par excellence.* The same constitution was observed in other portions of Algeria whose topographical and other conditions were very various. Taking the military hospitals of Algeria in 1841 generally, the numbers stand thus:—

1st	Trimestre	15,582	= 39,913
2d	"	24,331	
3d	"	50,937	= 83,379
4th	"	32,442	
			123,292

Endemo-Epidemics.—These are intermittent and remittent fevers of every type, periodical neuralgiæ, and diarrhœa and dysentery—affections, however different in many respects, all springing from common causes, which

often rendered their progress and treatment identical. Of every 100 patients admitted, 85 laboured under this class of affections, and but 15 of all other maladies. After they have passed away, the health of the soldiers often continues long in a debilitated state—a condition termed by the author *chloro-anæmia:* and of 750 chloro-anæmics, above 100 became dropsical. While in the marshy districts of France the proportion of sporadic to intermittent diseases is about one-half, in Africa it is about one-sixth.

Relapses.—The admissions into the hospitals of Algeria, 1841, amounted to 114,267, while the effective force was 75,000. "However high this figure may be, it does not indicate the proportionate number of diseases of our soldiers; for every soldier, prior to admission, had had quinine administered to him, sometimes five or six times. Upon inquiry of each patient on admission, we are astonished at the number of relapses, and it is remarkable that these are especially noticed after a sojourn in Africa for two or three years. In some individuals the relapses recur with such frequency, are produced by such slight causes, and prevented with so great difficulty, that they cannot properly be said ever to be free from the fever.

Mortality.—The mortality in the hospitals of Algeria, 1841, was 1 in 14·65, which is favourable, compared to that of the civil and military hospitals of France. The viability of the civilians is considerably less than in the most unhealthy localities of France. The deaths are 1 in 15, and of the indigenous tribes who neglect medical aid, 1 in 13. As to the influence of *age*, the endemo-epidemic affections are most potent from adolescence to 30, after which their power over the system decreases. The ages, 22, 23, 24, furnish the greatest amount of deaths: thus of 798 deaths, 545 occurred at or below 25, and 253 at or above 26. In estimating these numbers it must be remembered, however, that the former age is that of the great body of the recruits. "The army," says M. Finot, "in the majority of its individuals, offers exactly the conditions, as regards age, which are most favourable to the contraction of endemo-epidemic diseases."

Diet and Regimen.—The author dwells upon the importance of supplying good flour for bread, and the dealing out a sufficiency of meat, which he thinks the French soldiers do not obtain. He truly says, military rations are not usually sufficiently varied according to the different seasons of the year. Of *Regimen* he observes—

"The doctrines of Pringle upon the causes of the diseases of troops may be applied with perfect truthfulness to our troops in Africa. That which was true a century ago still continues so at the present time. Pringle maintained that fever, diarrhœa, dysentery, &c., result from atmospheric influences and seasonal vicissitudes, and are not for the most part the product of excess on the part of the soldier, nor of his use of bad water, or abuse of alcohol. Not but these causes may and do produce, in some individuals, great derangements of health, but these are individual cases only."

The abuse of spirits leads to diarrhœa and dysentery rather than fever. Excessive coitus, masturbation, *i. e.* whatever tends to prostrate the nervous

energy, yields up the constitution defenceless to the causes of fever. Men who are well nourished, and especially such as have their intellectual powers regularly developed, usually resist influences to which others succumb. The author states confidently that, if recruits were not allowed to enter the African army until after the age of 25, at least one-third of the present mortality would be spared.

Upon the *Treatment* of the diseases of Algeria M. Finot observes :—

"1. The expectant mode is that adopted by the natives. They patiently wait until it shall please God to rid them of the fever;—but, while waiting, their constitution becomes deteriorated, the process of nutrition perverted, and the viscera engorged; and they perish young and almost in a state of anæmia. 2. The purely antiphlogistic method is condemned by facts. 3. The evacuant method, employed exclusively, is inadmissible. 4. The exclusive administration of quinine may advantageously be substituted for any of these modes. 5. The mixed plan of treatment consists in the combined use of antiphlogistics, or evacuants and quinine. 6. Lastly, there is the electic mode of treatment, which, especially in the treatment of the endemo-epidemic affections, draws its indications from the season, the medical constitution of the locality, the age, sex, and constitution of the patient, the duration, type, and complications of the malady, the condition of the organs, &c.;—and having well considered and weighed all information so derived, employs as means of cure all the agents to which it has access, quinine, opium, as well as depletions, emetics, and revulsives."

A paper is contributed by Dr. Bruguière upon the medical topography of *Milianah*, for the purpose of exhibiting the sanatory effects of attention to all the requirements of hygiene, and the provision of good hospital accommodation. This town, captured by the French from the Arabs in 1840, was the one of all others in which the first garrisons suffered the greatest mortality, which was attributed to the influence of the sirocco, malaria, and similar causes. The effect of these from the locality of the place the author denies; and attributes the cruel ravages to the wretched accommodation offered to the troops, who were at the same time submitted to excessive labour under a burning sun, and could obtain but an insufficient supply of provisions. Under these circumstances the mortality, though dreadful, was not surprising. A garrison of 1200 furnished 2217 admissions into such wretched hospitals as could be provided in the course of the first four months, and, in four months after, there were 676 deaths recorded. He presents a tabular view of admissions and deaths, showing, among other results, that while 2217 admissions in 1840 furnished, in four summer months of 1840, 568 deaths, 572 admissions in the same months; and the improved condition of 1841, furnished but 44 deaths. The circumstances to which he attributes this improvement are, the excellent supply of food, the cleansing the streets and roads, the construction of a good hospital, the moderate employment of the troops, and the provision for their recreations.

Respecting the *Sirocco*, Dr. Bruguière observes—

"The sirocco, or wind from the southern desert, which is said to have blown last year during forty consecutive days, and the influence of which we often feel, produces an ardent heat, which so instantly rarefies the air that breathing becomes panting and difficult. Although it exerts its influence upon all individuals, it does so in an especial manner upon those of a nervous or irritable temperament, in whom it produces a condition of general debility, accompanied

by violent pains in the limbs. The organ it especially affects in these is the stomach, in which it induces a condition of atony, or indifference to the presence of food, which it either rejects or digests imperfectly, or a vehement craving for alcoholic and exciting drinks, which, however, when taken in moderation, calm its appetence and restore its energy. Prepared by the observations of my predecessor last summer, I expected to find, during the early months of my residence in this town, that the Sirocco played a great part in the diseases which came under my observation, and I determined to study very attentively the nature of its influence upon their production, course, and termination. To the present time I have been able to make no other general observation than the one mentioned above, and I am almost tempted to believe that they have attributed to this wind a more evil influence than it really exerts."

The department of the Collection devoted to *Clinical Surgery* contains several interesting cases. We may advert to one or two of these. The first was a most extensive *gun-shot wound of the face* (suicidal), several of its bones being severely fractured; reparation, however, took place to a surprising extent, and that with very little constitutional disturbance. The patient was about to be discharged, ten weeks after his admission, when he complained of slight pains in the head, which quickly augmented in severity, and became accompanied by remarkable prostration of strength, and slowness of pulse (30). He died in four days, not having exhibited any lesion of intelligence, loss of sensibility, paralysis, or convulsion.

The examination proved, however, that mischief had long been going on within the brain, although untestified by any symptom, until the last three or four days. The entire right anterior lobe was in a state of pulpy *ramolissement*, and its interior surface converted into one vast abscess, extending beyond the fissura Sylvii, and communicating with the ventricles, into whose cavities, as well as into the vertebral canal, the pus had penetrated. Below, all cerebral matter was completely destroyed, the membranes alone separating the abscess from the bones. The internal surface of the left lobe, where it came in contact with the right, was also in a state of *ramolissement;* but no vascular injection or other alteration was observed in other parts of the brain. At the right side of the *crista galli* a perforation, communicating with the nasal fossa and frontal sinus, was discovered, large enough to admit the point of a finger. Looking into the nasal fossa through this aperture, a foreign body was observed to be lodged within it, which was easily removed by a forceps. It proved to be half a bullet, so that the ball must have split into two pieces, one of which, after effecting the perforation in the ethmoid, fell back again into the nasal fossa and there remained. No foreign body whatever was found within the cavity of the skull.

Another case was also an example of the insidious progress of a formidable disease. The limb of a patient, who was suffering from *necrosis of the ankle-joint*, was removed. The stump cicatrized, although slowly, but an obstinate diarrhœa, and an œdematous condition of the limb coming on, the patient eventually sank about two months after the operation. At the post-mortem an enormous abscess was discovered in the abdomen, in contact with the lumbar region of the spine. Five of the vertebræ, and a portion of the sacrum, were in a condition of extensive *caries*. The veins leading to the lower extremities were inflamed, and filled with coagula.

The medullary substance of the tibia of the amputated limb was also found in an inflamed condition, and upon the last point M. Marchal, commenting upon the case, thus observes :—

"We cannot too earnestly call attention to *osteo-myelitis* succeeding amputation, which is the unsuspected cause of death in a great number of fatal cases. Lately, the limb of a patient, under the care of M. Velpeau at la Charité, was removed for cancer of the knee. After some days he was seized with shivering, and then with the various symptoms characteristic of the ataxo-adynamic condition. The medulla projected like a mushroom from its canal, and many believed it to be a sudden reproduction of the cancer. Upon examination after death, the whole interior of the femur was found of a bright red from the point of its division."

The last case to which we shall allude is termed by its reporter, an example of *spina ventosa of the humerus* successfully treated by hydriodate of potash. The soldier was admitted into the hospital in 1841 with two-thirds of the superior portion of the left humerus in a state of great hypertrophy, and that especially where the middle and lower thirds of the bone are in contact. Pressure was attended with a slight crepitation. The tuberosities participated in the development. The skin was somewhat reddened and tense. The muscles free and unadherent, but diminished in size. Two years before he had perceived a small tumour near the external tuberosity, the bone at the entire upper part of the arm shortly after enlarging. Suppuration formed in the little tumour, and a small quantity of matter was discharged from a fistulous opening from time to time, with little pain or irritation, the power of movement of the extremity being however considerably enfeebled. About a twelvemonth before his admission, the limb, which had remained very quiet, was struck against a table, after which the pain became much more severe, and the pus re-appeared and continued to be discharged.

The patient, who was of a lymphatic temperament, and scrofulous descent, was placed upon a tonic regimen, and hydriodate of potass was prescribed, mercurial frictions being applied to the arm. For some days after, the pain became much increased in severity, but not augmented by pressure. On the eighth day, the patient complaining of the excess of pain and more limited range of motion of the arm, M. Godard examining it, discovered that the humerus was fractured at the most prominent part of the hypertrophy, a little below the middle portion of the bone. The man was not aware of this accident, and only recollected that he suffered great pain upon awakening in the morning. The fracture was somewhat oblique, the superior fragment being drawn outwards and forwards, projecting prominently beneath the skin. The volume of the arm was in creased, while its length, which, prior to this complication, was slightly augmented, was as much diminished. The adjustment of the fracture caused excessive pain. Very firm pressure, by means of bandages and splints, was maintained and gradually increased; and on the 20th day the volume of the bone was found evidently diminished, and the fractured portions in good adaptation. The hydriodate was augmented in dose from time to time, and the patient's health continuing to improve, the apparatus which had been firmly bound until then, was removed on the 65th day. The size of the bone being much diminished, and certain

eminencies and rugosities, before very perceptible, nearly effaced, on the 85th day the patient began to use his arm. The muscles had contracted adhesions with subjacent parts, and the movements of the limb were long very limited. These became gradually more extensive, and the absorption of the enlargement continued when he was dismissed, so that the difference between the two arms was comparatively trifling.

M. Godard observes, in reference to the medicine employed,—

"Having obtained very remarkable results from the employment of the hydriodate of potash in the treatment of many exostoses situated in different parts of the body, some syphilitic, but the greater part not arising from syphilis, I determined upon trying it associated with bitters in the present case. I have employed it in a great number of old and obstinate glandular enlargements, with some success; but its effect is less certain and more slow in these maladies than in the diseases of the osseous tissue."

Our space forbids our noticing two interesting papers, one upon the Dislocations of the Astragalus, and the other upon the Solubility of various Salts. There is also a code of minute Instructions issued by the Military Council of Health for the prompt treatment of every variety of Asphyxia. Artificial respiration is forbidden under any circumstances as both useless and dangerous—the incipient respiratory movements being aided by repeated slightly alternated compression of the dorsal regions and flanks.

The volume terminates with a report of some of the addresses delivered upon the translation of the mortal remains of Broussais to the Val de Grace. Orations of this description, so frequent in France, may seem somewhat too theatrical to our more prosaic and phlegmatic temperaments; but still we must acknowledge there is something touching in the affectionate remembrance in which that country holds her great men; and we fear we may be sometimes too justly reproached with coldness and indifference in this respect.

I. THE PHARMACOPŒIA OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH. 12mo. pp. 217. Edinburgh, 1839.

The Second Edition of the above, 1841.

II. A DISPENSATORY, OR COMMENTARY ON THE PHARMACOPŒIAS OF GREAT BRITAIN, &c. &c. By *Robert Christison*, M.D. F.R.S.E. Professor of Materia Medica in the University of Edinburgh, Vice-President of the College of Physicians, &c. 8vo. pp. 978. Edinburgh, 1842.

III. THE LONDON DISPENSATORY, &c. &c. By *Anthony Todd Thomson*, M.D. F.L.S. Professor of Materia Medica, Therapeutics and Medical Jurisprudence in University College, London, Fellow of the Royal College of Physicians in London, &c. &c. 8vo. pp. 1317. London, 1844.

THE extraordinary progress which has been made in chemical science in general, and more especially in organic chemistry, within a few years, has

greatly increased the necessity for more frequent revisions of those national depositories of medicinal preparations—the Pharmacopœias of Great Britain.

This examination was more especially called for with respect to the Edinburgh Pharmacopœia, an edition of which had not appeared for about twenty-two years, until the present was published; the propriety of this step on the part of the College must be universally admitted, if it were for the purpose alone of introducing those important medicines the vegetable alkalis, with directions for their preparation and that of their saline combinations.

We now propose to examine somewhat minutely the Edinburgh Pharmacopœia, which made its appearance under the auspices of the then President of the College, Dr. Christison—a name known throughout Europe, and as widely respected, as the author of an excellent *Treatise on Poisons.*

Since the appearance of the Pharmacopœia, Dr. Christison's and Dr. Thomson's Dispensatories have also both been published, and to these works we shall have occasion to make frequent reference.

We shall offer no apology either to Dr. Christison or Dr. Thomson for the free observations which may arise during the proposed examination of their works; and from the time of Nich. Culpeper to the present, pharmacopœias, like other public acts, have been considered fair objects for criticism, and no one will deny the truth of the trite observation that the errors which are committed or sanctioned by authority are doubly dangerous.

Dr. Christison has shown, by his numerous remarks on the London Pharmacopœia, that works of this description are not to be excepted from the lash of criticism; and Dr. A.T. Thomson, in referring to the same work, says, in a former edition of his Dispensatory, that the London Pharmacopœia is "far from being worthy of the present advanced state of medical science;" a censure so indiscriminate and sweeping as this, naturally challenges inquiry into the nature of its author's criticisms, in order to ascertain their just value.

There are a few observations in the Preface of the Edinburgh Pharmacopœia requiring notice: the College say, "in the plan of the present Pharmacopœia we have thought it advisable to deviate materially in several respects from those of former years."

"That we have departed from all previous practice of Colleges in this country by publishing our Pharmacopœia in the English language is an alteration, which, as it has been sanctioned by the almost unanimous consent of the College, will also, we apprehend, meet with the general approbation of the medical public. The time is perhaps gone by when public opinion required as a test of learning that a College of Medicine should write in Latin alone; and it may even be questioned whether the practice be not open to censure as leading to risks of inaccuracy in preparing and compounding drugs. Besides, the favourable reception of unauthorized translations of former Pharmacopœias, together with the slow sale of the last Latin Edition of 1817, seemed sufficiently to indicate the wishes of the profession on this subject, and to show that the Latin language cannot be any longer retained, without occasioning, as of late, serious delays and obstructions in the way of future improvement."—*Preface*, p. viii.

Without questioning the propriety of the above-described change, we

may remark, that it has been but partially carried into effect; for not only are the Latin names of the articles of the *Materia Medica* retained, but even those of the *Preparations and Compounds*, and the latter, indeed, without being translated;—thus, to take the first preparation under the head of *Acids*, we have *Acetum Distillatum* without the English, and this incongruity pervades the whole work; it is indeed true that there is an English Index, in which there occurs *Vinegar, distilled*, p. 47; but it must surely be admitted, that in a Pharmacopœia professedly English, the Index is not the only proper place to find it.

The College afterwards remark, that "the increasing frequency and extent of the adulteration of drugs induced us to propose, a few years ago, to the Royal College of Physicians of London, in the course of certain negociations relative to an Imperial or General Pharmacopœia for the Empire, that to the List of the Materia Medica there should be added a short statement of characters for ascertaining, that the leading articles are free from known sophistications, and of the due degree of purity for medical use. The suggestion has been partly adopted in the recent edition of the London Pharmacopœia; and in the present work we have endeavoured to carry more completely into effect the principle we propounded."

It will be naturally concluded, by those who read this statement, that the very useful proposal which it contains actually originated with the Edinburgh College; it is extremely probable that both Colleges borrowed the idea from the Prussian Pharmacopœia of 1829.

In our present undertaking we shall not commence with the first preparation that the Pharmacopœia contains; this is the less requisite, because certain portions of the work have already been examined in two contemporary publications,* and, having stated thus much, we now proceed to offer some observations on various preparations and on the remarks which have been made upon them in the Dispensatories of Drs. Christison and Thomson.

Acidum Tartaricum.—It having been shown that the Edinburgh College in the first edition of their English Pharmacopœia had committed a great error in the formula for preparing this acid by forgetting that the dilute sulphuric acid of the London College is of a different strength from their own, this mistake is corrected in the 2d edition. There are, however, some remarks of Dr. Christison's on this acid, and on the London Pharmacopœia, which demand notice; he says (p. 51) of tartaric acid, that "soluble earthy salts form in its solution white precipitates, which are earthy tartrates." Doubting the accuracy of this statement, we mixed solutions of tartaric acid with those of the following salts: chloride of calcium, sulphate of lime, sulphate of magnesia, nitrate of barytes, nitrate of strontia, and alum, but no precipitation whatever took place in any one of them. It is indeed true that lime and barytes form insoluble compounds with tartaric acid, when the simple solutions of these earths are saturated with a solution of the acid; but when their *salts* are added to the acid, either no tartrate is formed, or it is held in solution by the acid which the tartaric has set free.

* Medical Gazette and Pharmaceutical Journal.

We shall now notice, once for all, one of a series of criticisms on the London Pharmacopœia which here appears for the first time, but which is with occasional variations of language repeated about thirty times in Dr. Christison's work: speaking of the London College, and of the tests which they have employed for ascertaining the purity of tartaric acid.—Dr. C. says (p. 51) "the effect of the salts of potash in separating from its solution a bitartrate of potash,—which the same College has annexed,—is a test of its nature, and not of its purity." Now unless the nature of a substance be known, how are we to judge of its purity? On referring to Benzoic Acid in the Edinburgh Pharmacopœia we find "Tests.—*Edin.* Colourless: sublimed entirely by heat," and with respect to arsenious acid, we meet with "Tests.—*Edin.* Entirely sublimed by heat;" now as arsenious acid is usually as colourless as benzoic acid, it is evident that, according to the Edinburgh plan, they may be regarded as identical, unless some proofs of their nature be also admitted, for both will answer to the tests proposed.

With respect to Tartaric Acid, two errors, but not very important ones, occur in Dr. Thomson's Dispensatory. In p. 860, it is stated that, "the use of the hydrochloric acid is to form with the chalk a chloride of *lime*," which ought to be of *calcium*, and it is mentioned that "100 grains of the crystallized acid, in solution, saturate 200 grains of crystallized carbonate of soda;" now as the equivalents of these substances are stated to be 75·48 and 143·42 respectively, the carbonate of soda required is 190 grains, for 75·48 : 143·42 : : 100 : 190.

Ammoniæ Aqua et *Ammoniæ Aqua fortior.*—Before we proceed to consider these important preparations, we shall offer a few observations on the extreme caprice both of the College and Dr. Christison, with respect to some points of nomenclature regarding hydrochlorate of ammonia. In the Materia Medica of the first edition of the Pharmacopœia we find this salt thus described:—AMMONIÆ MURIAS. *Hydrochlorate of ammonia*, and there are three preparations in which it is employed, viz. Ammoniæ Aqua, Ammoniæ Carbonas, and Spiritus Ammoniæ; in the directions for obtaining the first of these, it is termed Muriate of ammonia, in the second Sal-ammoniac, a name which it does not bear in the Materia Medica, while in the third, the College recur to Muriate of ammonia. In the second edition of the Pharmacopœia we find AMMONIÆ MURIAS, Hydrochlorate of ammonia, *Sal-ammoniac*; in this edition the last term is used in the directions for the second preparation above-named, while, in the first and third, muriate of ammonia is employed.

Dr. Christison has not much tended to dissipate the inconsistencies which I have pointed out: for where the College, under Ammoniæ Aqua, say Muriate of Ammonia, he has Sal-ammoniac; for under Ammoniæ Carbonas, both also use Sal-ammoniac instead of Muriate of Ammonia.

The following are the directions of the Edinburgh Pharmacopœia for preparing by one operation both solutions of ammonia, one of specific gravity 880, and the other of 960.

"Take of Muriate of ammonia, thirteen ounces;
Quicklime, thirteen ounces;
Water, seven fluidounces and a half;
Distilled water, twelve fluidounces.

Slake the Lime with the water, cover it up till it cool, triturate it well and quickly with the Muriate of ammonia previously in fine powder, and put the mixture into a glass retort, to which is attached a receiver with a safety-tube. Connect with the receiver a bottle also provided with a safety-tube, and containing four ounces of the Distilled water, but capable of holding twice as much. Connect this bottle with another loosely corked, and containing the remaining eight ounces of distilled water. The communicating tubes must descend to the bottom of the bottles at the further end from the retort; and the receiver and bottles must be kept cool by snow, ice, or a running stream of very cold water. Apply to the retort a gradually increasing heat till gas ceases to be evolved; remove the retort, cork up the aperture in the receiver where it was connected with the retort, and apply to the receiver a gentle and gradually-increasing heat, to drive over as much of the gas in the liquid contained in it, but as little of the water as possible. Should the liquid in the last bottle not have the density of 960, reduce it with some of the Stronger Aqua ammoniæ in the first bottle, or raise it with distilled water, so as to form Aqua ammoniæ of the prescribed density."

We candidly and unhesitatingly admit, that we are unable to comprehend these directions, and consequently have not attempted to reduce them to practice; we will therefore only remark, that the quantity of lime directed to be used is inconveniently and unnecessarily large.

By what appears to be a mere typographical error, Dr. Christison states that ammonia was discovered by Dr. Priestley in the pure gaseous state in 1790; the fact is, that he described it in the first volume of his Experiments on different kinds of Air, in 1774.

In page 101 of his Dispensatory, Dr. Christison says, "TESTS, *Edin. Lond.* Density 880° (882 at 62°, L.); one fluidounce with two fluidounces and a half (three L.) of water, makes the Aqua or Liquor Ammoniæ."

In page 106, with reference to this part of the subject, he observes, "the weaker solution of ammonia of the density 960 may be made at once from the stronger by adding to it, as the London College directs, three times its volume of water. Rather less water, however, is required; for one volume of solution at 880 with three volumes of water has a density of 985. The Edinburgh College directs two volumes and a half of water to be used."

Dr. Christison might have known that the error of directing three volumes of water instead of two for diluting the stronger solution of ammonia had been pointed out and corrected long before his work appeared; in the above quotation he states inaccurately the density of a mixture of three volumes of water and one volume of solution of ammonia of sp. gr. 880; these mixtures are nearly of a mean density, and that just mentioned is of sp. gr. 970 and not 985; and moreover, a mixture of one volume of 880, with $2\frac{1}{2}$ volumes of water, has a density of 965 instead of 960, as directed by the Edinburgh College; two volumes only of water should be used.

We have stated why we have not prepared the solutions of ammonia according to the Edinburgh formula; we shall, however, make a few observations on the results obtained by Dr. Christison by employing it. He tells us (p. 103) that, by "using one-fourth of the materials mentioned in the College formula," he obtained in the

Second	receiver	712 grains	of Solution of	Ammonia,	sp.	gr.	880
Third	do.	975	„	„	„	„	960
First	do.	835	„	„	„	„	971

According to Davy's table, quoted by Dr. Christison, the Solution in the

Second	receiver contained nearly	31	per cent. of Ammonia		=	220	grains.
Third	„ „	10	do.	do.	=	97	„
First	„ „	7·2	do.	do.	=	60	„
			Total Ammonia obtained			377	grains.

One-fourth of 18 ounces amounts to 1560 grains, and from this quantity of hydrochlorate of ammonia, which contains 490 grains of the alkali, only 377 were thus obtained, the loss of 113 grains, or nearly one-fourth of the whole, occurring notwithstanding the use of two safety-tubes, and of three receivers "kept cold by snow, ice, or a running stream of very cold water."

Dr. Christison further observes, that "in the trial of the Edinburgh method mentioned above, the product in the last two receivers obtained from three ounces and ten drachms avoirdupois of sal-ammoniac, when brought to the uniform density of 960, measured nine fluidounces and a-half; which account for 82 per cent. of the whole ammonia in the salt." Now 9½ fluidounces of solution of ammonia of sp. gr. 960 weigh 3,990 grains, which at 10 per cent. = 399 ammonia, but we have shown that the products of the second and third receiver amount to only 317 grains, and consequently they could form only 7·55 fluidounces of 960 instead of 9·5.

Dr. Christison calculates that the quantity of ammonia which he obtained in 9½ fluidounces of solution at 960, amounts to 82 per cent. of that contained in the hydrochlorate of ammonia employed by him; of this salt he used 3 ounces and 10 drachms avoirdupois, or 1586 grains, (containing 500 of ammonia,) instead of 3¼ ounces troy, or 1560 grains; nine fluidounces and a-half of solution of ammonia of 960 contain 400 of ammonia, certainly amounting to 80 per cent. of that contained in the salt; but we have shown that the whole contents of the second and third receivers contained only 317 of ammonia, amounting to less than 64, instead of 82 per cent. of the sal-ammoniac used.

In copying the Edinburgh formula Dr. Thomson has made a mistake, for the occurrence of which it is somewhat difficult to account: in the original, the water to be used is thus stated:—"Water, seven fluidounces and a-half; Distilled water, twelve fluidounces," which quantities are thus altered by Dr. T., "water, *seven fluidounces* and *a-half*; distilled water, *one pound*; water, *twelve fluidounces*."

Dr. Thomson concludes the formula of the Edinburgh College for preparing the solutions of ammonia, with the following statements. "The specific gravity of this solution of ammonia is to that of distilled water as 0·939 to 1000. It should be preserved in small vials well stopped." Now by the formula *two* solutions of ammonia of very different densities are directed to be prepared, one of density 880, and the other of 960, so that the density of 0·939 refers to neither. In fact, the passage above quoted is part of the formula of the Pharmacopœia of 1817, and was very properly contained in former editions of the London Dispensatory, but is out of place in the present.

Referring to solution of ammonia of density 0·960, Dr. Thomson says, "at 46° Fahr. the ammonia in this solution crystallizes, and at 68° the fluid assumes the appearance of a thick jelly." These statements also, appeared in the eighth and ninth editions, but in p. 188 of the latter we find it more correctly stated that the solution "forms a gelatinous mass when it is cooled down to 40° *below zero.*"

Ammoniæ Acetatis Aqua.—"The Spirit of Mindererus," Dr. Christison says, "should always be made with distilled vinegar, and not, as many druggists are in the practice of doing, with pyroligneous acid sufficiently reduced, for when made in the latter way its taste is more disagreeable, and it is more apt to spoil."

If by pyroligneous Dr. Christison means, as its name correctly imports, impure acetic acid obtained from the destructive distillation of wood, we admit the accuracy of that part of the foregoing statement which relates to disagreeable taste; but, if the acetic acid be prepared as it is in London, though procured from pyroligneous acid, the preparation is more pleasant than that made with distilled vinegar, for it is quite free from empyreuma, and we have kept it for about five months, under unfavourable circumstances, without its undergoing any change.

In reference to the variable strength of this preparation Dr. Christison remarks: "It will be apparent from what has been said under the head of Acetic Acid that, as vinegars differ exceedingly in point of strength, so may distilled vinegars, unless attention be paid to correct the product according to its density. Distilled vinegar, taken as just distilled, will be found to be occasionally three times as strong as in other samples."

For argument's sake we will admit the accuracy of this statement, and if it happen that the product of a distillation should be three times as strong as the standard, then indeed it might be corrected by the addition of water; but if it should occur, and it is much more likely to do so, that the product is weaker than the standard, we do not see how any correction can be made. In fact, supposing the statement to be correct, it is impossible to adduce a better argument for the substitution of diluted acetic acid for distilled vinegar.

The following are the directions of the London Pharmacopœia for this preparation.

Take of Sesquicarbonate of Ammonia four ounces and a half,
or as much as may be sufficient,
Distilled Vinegar four pints,
Add the Sesquicarbonate of Ammonia to the Vinegar to saturation.

In reference to this formula Dr. Christison says, "that, if the London College be right on the saturating power ascribed to its distilled vinegar as determined by carbonate of soda, the proportion of sesquicarbonate of ammonia recommended in the present process must be wrong. If thirteen grains of carbonate of soda neutralize a hundred grains of their distilled vinegar, then four ounces and a-half of sesquicarbonate of ammonia are more than enough to saturate four pints of it."

The saturating power of the distilled vinegar is to be determined in the present case by that of sesquicarbonate of ammonia, which, being subject

to some variation, the directions are, "add the sesquicarbonate of ammonia to the vinegar to saturation."

If, however, these directions are to be understood as Dr. Christison would interpret them, what is the meaning of the following words of the Edinburgh College in the formula for preparing Citric Acid? "Take of lemon-juice four pints; prepared chalk four ounces and a half, or a sufficiency." Do the Edinburgh College put the same construction on these words that Dr. Christison does upon the similar expressions of the London College? Certainly not, for they say, "add the chalk to it [the lemon-juice] while hot, by degrees, till there is no more effervescence, and the liquor ceases to taste acid," in other words, "to saturation." In point of fact, both Colleges employ a definite quantity of the acids, and an indefinite portion of the bases in the first instance, saturation determining the exact quantity.

But let us now examine the mode in which the Edinburgh College directs the preparation of Ammoniæ Acetatis Aqua:—

"Take of Distilled Vinegar (from French Vinegar in preference) twenty-four fluidounces;
Carbonate of Ammonia, one ounce.
Mix them and dissolve the salt. If the solution has any bitterness, add by degrees a little distilled vinegar till that taste be removed."

Following the plan adopted by Dr. Christison, of determining the saturating power of vinegar with respect to sesquicarbonate of ammonia by that which it possesses as to carbonate soda, we find it stated, in the Materia Medica, that 100 minims of distilled vinegar of sp. gr. 1005 neutralize 8 grains of carbonate of soda, consequently, 24 fluidounces, or 11,520 minims, saturate 921 grains of the carbonate, equivalent to 377 only of sesquicarbonate of ammonia (144 : 59 : : 921 : 377), whereas the College order 480 grains of the ammoniacal salt to be used at once, without any attempt to determine the state of saturation; the directions are, "mix them and dissolve the salt"—not "to saturation," as in the London Pharmacopœia.

The excess of carbonate of ammonia amounts to 103 grains, or more than one-fifth of the whole quantity used; it is, indeed, true, that "a little distilled vinegar" is to be added by degrees to remove any bitterness which the solution may possess, but it could hardly have occurred to the College, that this little must amount to about one-fourth of that which had already been employed.

We will venture a little further in examining the reasonableness of Dr. Christison's criticism, by inquiring what would have been the excess of carbonate of ammonia in the London formula, supposing that it had directed like the Edinburgh College, the whole of the vinegar and ammoniacal salt to be mixed at once, without examination as to the state of saturation. As 100 grains of the London distilled vinegar saturate 13 grains of carbonate of soda, and supposing the density to be 1006, four pints must weigh 35,210 grains, and saturate 4,577 grains of carbonate of soda, or 1875 grains of sesquicarbonate of ammonia, the excess amounting to 285 grains, or less than one-eighth of the whole quantity, instead of more than one-fifth, as in the Edinburgh Pharmacopœia.

Dr. Thomson has inadvertently omitted from the formula of the London Pharmacopœia the words "or as much as may be sufficient." He says,

"in our experiments, distilled vinegar of a specific gravity of 1·007 required 320 grains of the sesquicarbonate to saturate a pint." According to the table of the densities and strengths of acetic acid, quoted by Dr. Thomson, acid of sp. gr. 1·007 contains about 4·25 per cent. of real acid, a pint of which should saturate 433 grains instead of only 320 of the ammoniacal salt; suspecting, however, that this statement might have been copied from a former edition of the Dispensatory which had appeared before the introduction of the imperial pint, we referred to the eighth, and there we found it, and evidently meaning the wine pint.

Ammoniæ Bicarbonas.—This salt has been introduced into the Dublin Pharmacopœia, and Dr. Christison justly remarks, that it seems to be an unnecessary addition; he states, but on whose authority we know not, that it contains only one equivalent of water; Berzelius mentions that it contains two equivalents, and with him other chemists agree.

After mentioning this salt as containing ammonia, Dr. Christison adds, "or, according to the new theory of the constitution of the ammoniacal salts, it is an anhydrous compound of one equivalent of oxide of ammonium, and two of carbonic acid ($HN^4\ O+2\ CO$);"—two mistakes occur in this formula, HN^4 should be NH^4, and 2 CO should be $2\ CO^2$—indeed, this latter mistake occurs four lines before; but, if we regard this salt as containing ammonia, it also contains two equivalents of water; and one of these must remain undecomposed, on the theory of the formation of oxide of ammonium, and therefore its formula must be $HO,NH^4O+2\ CO^2$. A still more recent view of the constitution of ammoniacal salts is that proposed by Dr. Kane, who considers ammonia as a compound of amidogen and hydrogen NH^2,H or Ad H.

Ammoniæ Spiritus.—We admit the accuracy of Dr. Christison's statement that, in this preparation, "the ammonia is obtained upon precisely the same chemical principles as for the watery solution." We cannot, however, agree with him, that the formula "requires no comment." In preparing the aqua ammoniæ, the College employ equal weights of hydrochlorate of ammonia and lime, the latter being nearly twice as much as absolutely requisite; but in this preparation, the quantity of lime is even one-half greater than that of the ammoniacal salt—surely no reason can be assigned for this increased quantity.

Antimonii oxidum.—The following is the formula of the Edinburgh Pharmacopœia for this preparation.

Take of Sulphuret of Antimony in fine powder, four ounces;
Muriatic Acid (commercial) one pint;
Water, five pints.

Dissolve the sulphuret in the acid with the aid of a gentle heat; boil for half an hour; filter; pour the fluid into the water; collect the precipitate on a calico filter; wash it well with cold water, then with a weak solution of carbonate of soda, and again with cold water till the water ceases to affect reddened litmus paper. Dry the powder over the vapour bath.

For reasons which do not appear, Dr. Christison has substituted *liquid* for *fluid*, *cloth* for *calico* and *washings cease*, for *water ceases;* there seems

to be no harm in the alteration, but the amendment is not equally obvious.

It is stated by Dr. Christison that "the quantity of muriatic acid used in the process appears large, being at least three times as great as is required to furnish the due proportion of chlorine for forming the sesquichloride. It is nevertheless necessary; Dr. Clark of Aberdeen informs me that he has in vain attempted to reduce the quantity."

We admit the accuracy of this statement as to the excess of muriatic acid, and although Dr. Clark is an authority from whom we hesitate to differ, yet direct experiment has assured us that his opinion is erroneous. We found that five fluidounces or a quarter of a pint of muriatic acid of density 1160 dissolved two ounces of sulphuret of antimony, which, with an acid four per cent. weaker, is exactly double the Pharmacopœia quantity. The precipitated oxichloride was perfectly white, and we have no doubt but the acid would have dissolved more sulphuret; we are therefore quite satisfied that considerably more than half of the muriatic acid ordered by the Edinburgh College is entirely wasted.

The name given in the Dublin Pharmacopœia to the precipitate obtained by adding water to sesquichloride of antimony is Antimonii Oxydum nitromuriaticum, which Dr. Christison explains to be "sesquioxide of antimony, with some adhering chloride of antimony;" this however is neither a translation nor a correct description, for it is a definite crystallizable compound, or oxichloride of antimony, consisting, according to Professor Johnstone, of 9 equivalents of sesquioxide and 2 equivalents of sesquichloride of antimony; in p. 134, Dr. Christison again misstates its composition, calling it "dichloride of antimony." He further observes, that "the process is productive according to the quality of the sulphuret used. Dr. Barker got 16½ grains of the Dublin oxide from 20 grains of sulphuret; but I have got as much as 1534 from 1750." This is in the proportion of 17½ from 20, being one grain more than obtained by Dr. Barker.

Antimonium Tartarizatum.—With respect to this preparation Dr. Christison remarks, that "its name has been much tortured by reformers of pharmaceutic nomenclature. The original convenient term Tartar-emetic was successively changed to Tartarized antimony, and the Tartrate of antimony and potash; but now the London College has invented a newer designation still, which, according to the principles of nomenclature in its new Pharmacopœia, if it has meaning at all, implies the belief of the College that this double salt is a compound, not of tartaric acid with two bases, but of one base, oxide of antimony, with a compound acid, potassio-tartaric acid, of which potassium is one of the radicles. I am not aware that any chemist in recent times believes in the existence of such an acid."

Nor are we aware that any chemist ever thought of its existence till Dr. Christison "tortured" it into being; to show, however, that no such meaning has been attached to salts whose nomenclature is constructed on the same principle, we may refer to Dr. Thomson's Inorganic Chemistry, vol. 2, p. 792, where he describes a series of salts as *potash-tartrates*, and among them is *potash-tartrate of antimony*—the salt in question; in Brande's Manual we find (p. 917) *Potassio-sulphate of Chromium;* does Dr. Christison suppose that this last salt is imagined to contain *potassio-*

sulphuric acid? He may perhaps contend that Dr. Thomson uses the word *potash* and not *potassio*, and if he thinks that such plea will strengthen his criticism, we readily grant him all the support that he can derive from it.

We have already noticed Dr. Christison's statement, that the Antimonii Oxidum nitromuriaticum of the Dublin Pharmacopœia, is "sesquioxide of antimony with some adhering chloride of antimony;" and, in p. 146, the assertion is repeated, that "in the process of the Edinburgh and Dublin Colleges, there is first obtained a sesquioxide of antimony with a little adhering chloride." In proof of the inaccuracy of this statement, we again refer to Professor Johnstone's Memoir, by which it appears "that the composition of the powder of algaroth, whether in the form of a dull gray sandy powder, or of regular crystals, is very constant," consisting, as he shows, of 74·5 per cent. of sesquioxide with 25·5 per cent. of sesquichloride. Now one-fourth can hardly be reckoned "a little."

The following are the directions of the Edinburgh Pharmacopœia for preparing Antimonii Potassio-tartras:

"Take of Sulphuret of Antimony, in fine powder, four ounces;
Muriatic acid (commercial) one pint;
Water, five pints;
Dissolve the sulphuret in the acid with the aid of a gentle heat; boil for half an hour; filter; pour the liquid into the water; collect the precipitate on a calico filter, wash it with cold water till the water ceases to redden litmus paper; dry the precipitate over the vapour bath.
Take of this precipitate three ounces;
Bitartrate of potash, four ounces and two drachms;
Water, twenty-seven fluidounces;
Mix the powders, add the water, boil for an hour, filter, and set the liquid aside to crystallize. The mother-liquor when concentrated yields more crystals, but not so free of [from] colour, and therefore requiring a second crystallization."

We shall first theoretically examine into the propriety of the assigned quantities of the bitartrate and oxichloride, which are four ounces or 1920 grains of the former, and three ounces or 1440 grains of the latter. Now by referring to the composition of crystallized tartarized antimony it will be seen that 189, or 1 equivalent of bitartrate, is combined with 154 or two equivalents of sesquioxide, and consequently 1920 will require 1564; according to the analysis of oxichloride, already quoted, 100 contain 76·8 of metal, equivalent to 90 of sesquioxide of antimony; 1440 will therefore yield only 1296 of oxide instead of 1564 as required; the proportions of 100 of the salt to 80 of the oxichloride, which are the quantities of the Dublin College, are certainly preferable to 100 and 70, the proportions of the Edinburgh College; indeed, in our experiments made many years since, it appeared that 90 of the oxichloride to 100 of the bitartrate were the best proportions to be employed; a slight excess, which remains for future use, seems requisite to ensure the perfect saturation of the acidulous salt.

Referring to the formulæ of the three Colleges, Dr. Thomson remarks that, "by all these methods, a little modified, crystallized tartar-emetic may be prepared;" this means, we presume, that without some modification, it cannot, which opinion is certainly at variance with fact, for without any alteration they will all yield the salt in question. We do not mean to

assert that they might not be improved, but this is very different from insinuating that they are totally inefficient.

"With regard to the formula of the London College, it is," says Dr. T. "a bad modification of the Edinburgh process." The following extraordinary reason is given for this opinion: "the intention of the addition of the hydrochloric acid is to prevent the formation of sulphuret of potassium, and the presence of free potassa, in the residue of the ignition; but a chloride of antimony is also formed, which in crystallizing mixes with the crystals of the tartar-emetic, and requires many recrystallizations for their complete separation."

Now we will for a moment admit, what we do not believe, that chloride of antimony is formed, for only four fluidounces of muriatic acid are used with 24 ounces each of sulphuret of antimony and nitre, and of the acid a great portion is certainly occupied in the mode described by Dr. Thomson. In the Dublin Pharmacopœia, 100 parts of muriatic acid are employed with 20 of sulphuret of antimony, and yet Dr. Thomson says it is "to be regretted that it was not adopted by the London College." Now, if the small quantity of muriatic acid employed by the London College occasions the crystallization of chloride of antimony, what effect is produced by the larger quantity used by the Dublin College? The fact, however, is, and Dr. Thomson must be well acquainted with it, that when chloride of antimony comes into contact with water, it is decomposed into muriatic acid and oxichloride of antimony, and it is consequently quite impossible that it should crystallize with the tartarized antimony. We will only further remark, that if the badness of the London formula depends upon the accuracy of the above statement, then it is faultless.

Liquor Arsenicalis.—We shall, in the first place, notice some inaccuracies which Dr. Christison has committed, with respect to this important preparation, by attempting to compress the differing directions of the three Pharmacopœias into too small a space: and, that we may do no injustice either to Dr. Christison or the subject under discussion, we shall give separately the directions of each Pharmacopœia; they are as follows:—

LONDON PHARMACOPŒIA. *Liquor Potassæ Arsenitis.*

℞ Acidi Arseniosi in frustula triti,
Potassæ Carbonatis, singulorum grana octaginta,
Tincturæ Lavendulæ Compositæ fluidrachmas quinque,
Aquæ destillatæ octarium;

Acidum Arseniosum et Potassæ Carbonatem cum Aquæ octario dimidio in vase vitreo coque, donec liquentur. Liquori frigefacto adjice Tincturam Lavandulæ Compositam. Denique adjice insuper Aquæ destillatæ quantum satis sit, u mensuram octarii accuratè impleat.

DUBLIN PHARMACOPŒIA. *Liquor Arsenicalis.*

℞ Arsenici Oxydi Albi Sublimati in pulverem triti,
Potassæ Carbonatis e Tartaro singulorum grana sexaginta,
Spiritûs Lavandulæ compositæ mensurâ drachmas quatuor,
Aquæ distillatæ *mensurâ* semilibram.

Arsenici Oxydum et Potassæ Carbonas simul in Aqua vase vitreo coque, donec solvatur Oxydum. Liquori frigefacto adjice Spiritum Lavandulæ compositum, et aquæ distillatæ quantum satis sit ut totius quantitas ex Librâ unâ *mensurâ* constet.

EDINBURGH PHARMACOPŒIA. *Liquor Arsenicalis.*

Take of White Arsenic in powder, and Carbonate of potash, of each, four scruples;
Compound Tincture of Lavender, five fluidrachms;
Water, one pint;

Dissolve the oxide and carbonate together in half the water, with the aid of heat; filter, if necessary; add the tincture to the liquid when cold, and then dilute it with water till the whole measure one pint.

We may remark that there are some slight inaccuracies in these directions; first, the words *of each* should have been merely *each*, the word *of* having been employed before; secondly, no oxide is mentioned, and yet the directions are to dissolve the *oxide*, they should have been to dissolve the white arsenic; thirdly, in so important a preparation distilled water might have been ordered, without subjecting the College to the charge of incurring needless expense; fourthly, the Edinburgh Pharmacopœia contains a compound *Spirit* not *Tincture* of Lavender.

The directions of the three Colleges as above given, are thus compressed by Dr. Christison, in page 180 of his Dispensatory:

LIQUOR ARSENICALIS, *E. D.* LIQUOR POTASSÆ ARSENITIS, *L.*
Solution of arsenite of potass with excess of alkali.

PROCESS, *Edin. Lond. Dub.* Take of
Powder of white arsenic, eighty grains (60, D.);
Carbonate of potash, 80 (60, D.) grains;
Compound tincture of lavender, (four, D.) five fluidrachms;
Distilled water, a pint (old wine m. D.)

Dissolve the white arsenic and carbonate of potash in half a pint of the water by boiling them in a glass vessel: Filter if necessary: Add the tincture when the solution has cooled, and then distilled water till the whole measures a pint.

The reader cannot fail to observe that the formula given by Dr. Christison does not contain all the peculiar directions of any one College, while it comprehends directions which do not belong to some of them: for example, the Edinburgh College does not direct distilled water to be used, which Dr. Christison's formula does; the London College directs, and for an obvious reason, not powdered arsenious acid, but small fragments; the Dublin College directs carbonate of potash from tartar, which, though Dr. Christison may think useless, the authors of that Pharmacopœia may not, and, in directions purporting to have originated with them, it ought to have been inserted. Compound Tincture of Lavender is not to be found by that name in the Dublin and Edinburgh Pharmacopœias, they term it Compound Spirit of Lavender. There are other circumstances which must occur to any one who will make the comparison, proving that the formulas of the three Colleges should have been given at length; the only very material mistake is, however, in omitting at the end of the condensed formula (old wine m. D.) to show that the measure to which the Dublin preparation is to be made up, is the old wine and not the imperial pint.

Solutio Barytæ Muriatis.—With respect to this preparation Dr. Christison remarks that, "for no apparent reason, the London College has diluted the pre-existing solutions of the Colleges with nearly two volumes of water;" meaning of course the Dublin and Edinburgh Colleges, for

the London Pharmacopœia, until the present edition, did not contain any formula for this solution.

On examination, we certainly find that the former Dublin and Edinburgh Pharmacopœias contain directions for preparing the solution by dissolving one part of the salt in three parts of water; but it is a curious circumstance that Dr. Christison should have forgotten that what the London College has done "for no apparent reason," had been followed by the Edinburgh College; the London formula having been actually adopted in the present Edinburgh Pharmacopœia.

Bismuthum Album.—This is the name bestowed on this preparation by the Edinburgh College, because Dr. Christison says it "has resolved to avoid if possible the fluctuations of chemical language by adopting one of its old names, and a very convenient one, that of White Bismuth;" why then have not the College also adopted the name of white lead, certainly as old and as convenient a name as carbonate of lead?

With respect to tests, the Edinburgh College have considered it sufficient to state that white bismuth "forms a colourless solution with nitric acid, and without effervescence;" the following substances therefore resemble it—hydrate of lime, magnesia, hydrate of lead, and oxide of zinc.

The following observations, seemingly intended to have been appended to the remarks on Bismuth, are made by Dr. Christison in concluding those on Bismuthum Album: "the only officinal preparation is the *Pulvis bismuthi albi*, meaning, we presume, *Bismuthum album; P. bismuthi dis-nitratis* L. meaning *Bismuthi trisnitras;* and *P. bismuthi subnitratis* D. meaning *Bismuthi subnitras.*

Creta Preparata.—The method of testing the purity of this substance by the Edinburgh College, is the following: "A solution of 25 grains in ten fluidrachms of pyroligneous acid, when neutralized by carbonate of soda, and precipitated by 32 grains of oxalate of ammonia, continues precipitable after filtration by more of the test."

In the Materia Medica it is stated that 100 minims of pyroligneous acid, "neutralize at least 53 grains of carbonate of soda," therefore 10 fluidrachms or 600 minims, must neutralize 318 of the carbonate, which are equivalent to 110 of carbonate of lime, consequently 4·4 times the requisite quantity of acetic acid is ordered for dissolving the carbonate of lime, and hence the necessity of employing nearly ten times its weight of carbonate of soda to saturate the excess of acetic acid, before the oxalate of ammonia is added; Dr. Christison says, that the excess of acetic acid is useful, but in what way we are utterly at a loss to conjecture.

It is further to be observed, that the equivalent of oxalate of ammonia is 62, one half of which will of course decompose 25, or half an equivalent of carbonate of lime, whereas the College state that 32 are insufficient for this purpose.

Dr. Christison goes indeed still farther, and states that 32 of Oxalate of Ammonia will leave a little lime unprecipitated, if there be 90 per cent. of pure carbonate of lime in the chalk, meaning that 32 of oxalate of am-

monia are incapable of decomposing a solution of 22·5 of chalk, whereas they are capable of decomposing very nearly 26.

Calcis Murias.—The Edinburgh College has ordered this salt to be crystallized, which is a very inconvenient form, for in hot weather it fuses in its water of crystallization: it is, moreover, incorrectly stated, that "a solution of 76 grains in one fluidounce of distilled water, precipitated by 49 grains of oxalate of ammonia, remains perceptible by more of the test." Dr. Christison states its composition to be chlorine 35·42, calcium 20·1, and water 54, making its equivalent 109·52, and requiring one equivalent, or 62 of oxalate of ammonia for decomposition, consequently 76 grains will require scarcely 43 grains of oxalate of ammonia, instead of more than 49, as stated by the Edinburgh College: so that this latter quantity is sufficient for more than 86 of the crystallized chloride, instead of less than 76 as asserted.

Ferri Oxidum Nigrum.—This is thus directed to be prepared in the Edinburgh Pharmacopœia:

Take of Sulphate of Iron, six ounces;
Sulphuric Acid, (commercial) two fluidrachms and two fluidscruples;
Pure Nitric Acid, four fluidrachms and a-half;
Stronger Aqua Ammoniæ, four fluidounces and a-half;
Boiling water, three pints.

Dissolve half the sulphate in half the boiling water and add the sulphuric acid; boil; add the nitric acid by degrees, boiling the liquid after each addition briskly for a few minutes. Dissolve the rest of the sulphate in the rest of the boiling water; mix thoroughly the two solutions; and immediately add the ammonia in a full stream, stirring the mixture at the same time briskly. Collect the black powder on a calico-filter; wash it with water till the water is scarcely precipitated by solution of nitrate of baryta; and dry it at a temperature not exceeding 180°.

It may be first observed, that a *fluidscruple*, though here directed to be employed, is not admitted by the College in their "system of measures," p. xv.; and this, if we mistake not, is the only occasion on which it is adopted.

The Edinburgh College have given three translations of Aqua Ammoniæ fortior, namely, *Concentrated aqueous solution of ammonia*, *Strong ammonia*, and *Stronger solution of ammonia*; but so much do they appear to approve of what they term a "patchwork" nomenclature, that neither English nor Latin appears to have pleased them on this occasion, and perhaps on some others, and therefore, in defiance of all propriety, a name is used composed of both languages—*Stronger Aqua Ammoniæ*. We are quite at a loss to imagine what advantage is gained by using the stronger solution of ammonia in this preparation; it is less economical in preparing than the weaker, and Dr. Christison admits that "it cannot be poured from one vessel to another, or kept unless during winter, and in very well closed bottles, without parting with some of its ammoniacal gas; and hence the commercial *Aqua ammoniæ fortior* commonly ranges between 886 and 910." The latter part of this statement shows, therefore, that it is apt to lose about one-fourth of its ammonia.

It appears also, that whereas *commercial* sulphuric acid is sufficiently pure to dissolve sesquioxide of iron, *commercial* nitric acid is not sufficiently so to convert protoxide into sesquioxide, and accordingly we find *pure* nitric acid directed for that purpose; it is, however, but candid to admit that, on a similar occasion, in the preparation of *Ferrugo*, commercial nitric acid is directed to be employed.

The oxide obtained by this process is explained in the Pharmacopœia and by Dr. Christison to be the "ferroso-ferric oxide, (Berzelius,) a compound of protoxide and sesquioxide of iron," but it is not the ferroso-ferric oxide of Berzelius.

In his *Traité de Chimie*, Berzelius states the octohedral magnetic iron ore to be the ferroso-ferric oxide; this is composed of one equivalent of protoxide 36, and two equivalents of sesquioxide 80; this, therefore, contains one more equivalent of sesquioxide than the Edinburgh preparation, which consists of one equivalent of each. In his *Table Synoptique* Berzelius mentions another ferroso-ferric oxide, which is composed of one-and-a-half equivalent of protoxide 54, and one of sesquioxide 40, and it consequently contains half an equivalent more of protoxide than the ferri oxidum nigrum; it is therefore evident that this preparation is not either of the ferroso-ferric oxides of Berzelius. Dr. Christison afterwards, and more correctly, states that, according to the analysis of Wohler, this compound may be regarded as composed of an equivalent of protoxide 36, and one of sesquioxide 40; indeed, it is evident that this must be the case, for equal quantities of iron are precipitated together, one half being protoxide and the other sesquioxide, and these oxides, to adopt Dr. Christison's rather singular description, "unite at once in the act of separation."

In copying this formula, Dr. Thomson has stated "*four fluid ounces and a half*" of nitric acid, instead of *four fluidrachms and a half.*" With respect to the composition of the ferri oxidum nigrum, he says, "this is an admixture of two oxides, namely, 2 eqs.$=$72 of the protoxide, and 1 eq.$=$40 of the sesquioxide, and 2 eqs.$=$18 of water; its formula being $1\frac{1}{2}$ Fe. O.$+$Fe.^{1} O^1$+$2 HO. In this statement Dr. Thomson has reversed the equivalents of protoxide and sesquioxide; they being respectively 1 to 2, and not 2 to 1; moreover, when this correction is made, it does not represent the composition of the Ferri Oxidum Nigrum, as we have already shown; if we understand the formula given by Dr. T., it means a compound of one equivalent of an oxide of iron, consisting of $\frac{1}{2}$ equiv. of iron, and 1 equiv. of oxygen, which does not exist, combined with 1 equiv. of protoxide of iron; so that an incorrect composition is illustrated by an incorrect formula.

[*To be concluded in our next Number.*]

The Anatomy and Philosophy of Expression, as Connected with the Fine Arts. By Sir *Charles Bell*, K.H. &c. 3d. Edition, enlarged. 8vo. pp. 265. London: Murray, 1844.

This work has a peculiar, and even melancholy interest, in more respects than one. It is the first and the last of the gifted author's published writings. It was originally composed while he was yet a student, "before"—as he gracefully says in the dedication to his brother—"the serious pursuits of life began;" and he was engaged, we believe, in revising the present edition for the press, when he was seized with his fatal illness at Hallow Park, in Worcestershire, on the 29th of April, 1842.

Charles Bell was a man of a truly original cast of mind. From his youth, he had learned to think for himself; and his thoughts had early been turned to the study of the Nervous System. Being an accomplished draughtsman, and having naturally a lively taste for the fine arts, he was in the habit of occupying his leisure hours with portraying, alike with his pencil and his pen, the outward and visible features of the various passions that agitate the human breast. The taste for such pursuits never left him; the very day before his death, he was engaged in his favourite amusement. He much mistook, we have often thought, the part which Nature designed him for, when he applied himself to the active pursuit of practical surgery. The bias of his mind lay in quite an opposite direction. He was too contemplative a character, and, moreover, his feelings were far too sensitive, for many of the every-day duties of a hospital surgeon. He had a dislike for all cutting operations, and an aversion from inflicting pain even on the lower animals. In spite of all his exertions, he never could have become an *Astley Cooper* or a *Dupuytren*: he was not made of the same stuff as these men. Each had his reward. The leading surgeon of the French, as well as he of the English, metropolis, enjoyed a boundless reputation during his life, and left an enormous fortune behind him. The fame of both stood high for many years; but now, if we mistake not, it is on the wane: and, ere long, these once great surgeons will cease to be regarded as shining lights in the professional hemisphere. Not so with *Bell*. But partially appreciated by his cotemporaries, his reputation will unquestionably increase with increasing years; and posterity, we doubt not, will rank his name with those of *Harvey* and *John Hunter*.

Sir Charles had early caught a glimpse of that great discovery which shed so bright a lustre over his maturer years; and certainly not the least interesting feature of these Essays is, that they clearly contain the germ of this discovery, and show us some of the steps by which he was led to its attainment. It is a vulgar error to suppose that the finding out of any great and comprehensive truth was ever made by what is generally termed "a lucky thought," or without the previous discipline of long and deep reflection on the subject. There was no exception to this remark in the case of our lamented author. At the very threshold of his professional career, he saw and accurately described the wide extent and the complicated relations of the function of Respiration; pointing out how distant and seemingly unconnected parts of the body are intimately bound and

associated together, in the performance of this vital act, and of the numerous accessory phenomena that are dependent upon it. With no less physiological acumen than with refined artistic taste, he perceived that it was not the lungs and the muscles of the chest *alone* that are engaged in the carrying on of the process of breathing, under the excitement of any passion; but that the muscles of the face, throat, neck, shoulders and trunk are *then* all, more or less immediately implicated. The great painters and sculptors of Greece had fully understood the truth of this corporeal complex association, by studying the undressed figures of their countrymen in their gymnastic games, and other exhibitions of agility, strength, and passion. They knew not indeed the cause of those combined physical appearances; but, by closely observing Nature, they had learned to represent them with marvellous fidelity in their pictorial and sculptural designs. It remained for Charles Bell to discover the *why* of the sympathetic union of so many parts in the production of one effect; to find out the clue of a complex and seemingly entangled web; to educe harmony from seeming discord, and the most orderly design from seeming confusion. Few medical men are, we believe, aware of the simple yet comprehensive grandeur of his discovery of the respiratory system of nerves; they may know its anatomical details, but they have not studied it in a physiological or an artistic point of view: nor have they even learned to appreciate its intimate relations with many of the most common acts of the body, such as crying, laughing, weeping, and so forth. Each of these acts is nothing but a natural and spontaneous effort of the system to restore, to normal quietude, a disturbed state of the breathing and of the circulation of the blood; and all the visible phenomena or outward expressions of the Emotions, which give rise to them, are more or less directly connected with this instinctive effort—this *vis conservatrix naturæ.*

The Breast is the part of the body that is instinctively referred to as the *seat* of the passions; and the common language of every people gives currency and sanction to this idea. And yet we know that they are only mental acts or varying conditions of the immaterial mind, and cannot therefore be seated in the body, however much they may influence or be influenced by it. The effect is thus substituted for the cause; the bodily feeling for the mental act. So intimate however is the connection between these two states that, if the bodily sensation is in any way induced independently of the operation of the mind, the cognate and corresponding sentiment, or something very much akin to it, will at once be experienced. For example, do we not daily observe that the tremour of the limbs, the coldness of the skin, the chattering of the teeth and rapid throbbing of the heart, in the common act of febrile shivering, are invariably accompanied with the feelings of trepidation and fear?—and will not the mere effort of clenching the fist, holding the breath, and steadily fixing the eye upon one object, induce—almost in spite of our efforts to the contrary—a sentiment of indignant resolution in our breasts? How admirably has Shakespeare illustrated the force of this alliance in the following well-known passage, in which Henry V. strives to inflame the zeal and courage of his soldiers!

"But when the blast of war blows in our ears,
Then imitate the action of the tiger:

> Stiffen the sinews, summon up the blood,
> Disguise fair Nature with hard-favour'd rage!
> Then lend the eye a terrible aspect;
> Let it pry thro' the portage of the head,
> Like the brass cannon: let the brow o'erwhelm it,
> As fearfully as doth a galled rock
> O'er-hang and jutty his confounded base,
> Swill'd with the wild and wasteful ocean.
> Now set the teeth, and stretch the nostril wide;
> Hold hard the breath, and bend up every spirit
> To his full height."

Sir Charles ingeniously attempts to explain, or at least illustrate, this connexion between certain bodily states and the development of certain mental emotions, by directing our attention to something analagous to it in the exercise of our sensual perceptions. The following passage will best convey to our readers the train of reasoning whereby he endeavours to show, that what the Eye, the Ear, or the Tongue is to the mind, as exciting those ideas which have been appointed to correspond with the qualities of the material world, the organs of the Breast are to the development of our affections.

"By emotions are meant certain changes or affections of the mind, as grief, joy, astonishment. That such states or conditions of the mind should in any degree pertain to the body, may not, perhaps, be willingly admitted; unless we take along with us that the ideas of sense, as light, sound, or taste, are generated by the organs of the senses, and not by any thing received and conveyed by them to the sensorium. It is ascertained that the different organs of the senses can be exercised, and give rise to sensation and perception, when there is no corresponding outward impression; and the ideas thus excited are according to the organ struck or agitated: that is, the same impression, conveyed to different organs of sense, will give rise to a variety of sensations; as light, when the eye is struck; sound, when the ear is struck; and so on with the other organs; the sensation corresponding with the organ which is exercised, and not with the cause of the impression. A needle passed through the retina, the organ of vision, will produce the sensation of a spark of fire, not of sharpness or pain; and the same needle, if applied to the papillæ of the tongue, will give rise to the sense of taste; while if it prick the skin, pain will follow. This law of the senses is arbitrarily or divinely ordered; it might have been otherwise. Accordingly, when we observe that the organs of the senses operate in producing specific ideas, independently of their own peculiar exciting causes, we can comprehend better how other organs of the body may have a relation established with the mind, and a control over it, without reference to outward impressions." 85.

Without pursuing this subject, which touches on the limits of metaphysical inquiry, let us now endeavour to illustrate, by a few examples, the expression or corporeal manifestation of certain strong mental emotions with the view of pointing out the intimate alliance between the development of such expression, and a disturbed state of the heart and the machinery of respiration: and first, of *Fear*. What says the sacred penman, in the account of the solemn vision that he saw, when deep sleep falleth on men? "Fear came upon me and trembling, which made all my bones to shake. Then a spirit passed before my face; the hair of my flesh stood up. It stood still, but I could not discern the form thereof; an image was before mine eyes; there was silence, and I heard a voice."

The chief features in this impressive description are reproduced in these lines of *Virgil:*

> " Mihi frigidus horror
> Membra quatit, gelidusque coit formidine sanguis."
> * * * * *
> " Arrectæque horrore comæ, et vox faucibus hæsit."

In other passages, the stiffened gaze and the relaxed powerlessness of limb are well described.

> " At juveni oranti subitus tremor occupat artus,
> Diriguere oculi ; "
> " Illi membra novus solvit formidine torpor."

Lucretius has graphically introduced many of the leading characteristics of terror in the following passage :

> —— " Ubi vehementi magis est commota metu mens,
> Consentire animam totam per membra videmus ;
> Sudores itaque et pallorem existere toto
> Corpore, et infringi linguam, vocemque oboriri,
> Caligare oculos, sonere aureis, succidere artus."

Compare with these several descriptions the following one by our author: it will serve to render the portrait more complete.

" We can readily conceive why a màn stands with eyes intently fixed on the object of his fears, the eyebrows elevated to the utmost, and the eye largely uncovered ; or why, with hesitating and bewildered steps, his eyes are rapidly and wildly in search of something. In this, we only perceive the intent application of his mind to the object of his apprehensions—its direct influence on the outward organ. But observe him further: there is a spasm on his breast, he cannot breathe freely, the chest is elevated, the muscles of his neck and shoulders are in action, his breathing is short and rapid, there is a gasping and convulsive motion of his lips, a tremour on his hollow cheek, a gulping and catching of his throat ; and why does his heart knock at his ribs, while yet there is no force of circulation?—for his lips and cheeks are ashy pale." 88.

In the agony of Grief, too, how strongly are all the organs of breathing affected! The respiration is low and infrequent, but every now and then broken by sobs and long-drawn sighs ; the neck and throat are convulsed with struggling, and their veins are full almost to bursting ; the face is deadly pale, while slight quivering motions pass from time to time over it ; the lips are swollen and trembling ;* tears gush forth in torrents from the eyes ; the hands are icy cold ; the limbs are nerveless and relaxed, and the poor sufferer sinks almost unconscious upon the ground. Now, if we attend to the manner in which these corporeal phenomena arise and succeed each other, it will be found that the primary effect of the vehement emotion is an immediate suspension of the act of breathing, followed by convulsive deep inspirations, and violent rapid expirations. These efforts are designed by Nature to relieve the congestion of the heart, and give

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* " The action of the Orbicular muscle of the lips is, indeed, the most characteristic of agony of mind, and of all those passions which partake of sentiment ; in grief, in vexation of spirit, in weeping, it modifies the effect of the muscles of animal expression, and produces human character."

freer play to the pulmonary circulation that has become in some degree obstructed, in consequence of the embarrassed state of the breathing. Who is there that has not experienced that sense of oppressive fulness, nay, even of sickening pain, in the cardiac region, when the mind is bowed down by some overwhelming affliction? And who has not felt the relief that is given thereto by the heaving sob, and the bursting tear?

> " The grief that does not speak,
> Whispers the o'erfraught heart, and bids it break."

Ovid has given a fine description of the stupefaction which sometimes characterizes intense grief—" the lethargy of wo;"

> " Obmutuit illa dolore;
> Et pariter vocem, lacrymasque introrsus obortas
> Devorat ipse dolor; duroque simillima saxo
> Torpet; et adversâ figit modo lumina terrâ:
> Interdum torvos sustollit ad æthera vultus;
> Nunc positi spectat vultum, nunc vulnera nati."—*Met. Lib.* xiii.

How different is the expression of Laughter on the one hand, or of Rage and severe Pain on the other, from that of the depressing passions!

" Observe the condition of a man convulsed with laughter, and consider what are the organs or system of parts affected. He draws a full breath, and throws it out in interrupted, short, and audible cachinnations; the muscles of his throat, neck, and chest, are agitated; the diaphragm is especially convulsed, He holds his sides, and, from the violent agitation, he is incapable of a voluntary act.

" It is impossible to avoid the conclusion, that it is the respiratory organs and their muscles which are affected during the paroxysm of laughter. Physiologists, in all former times, attributed the line of sympathetic relations which draw these remote parts into action, to a nerve called the sympathetic. But I have proved, that there is a machinery altogether distinct; and that the expression, not only of this, but of all the other passions, arises from that system of nerves, which, from their great office, I have called *respiratory.*" 147.

The effects of Rage are best portrayed in the savage animal.

" When the tiger or wolf," says our author, " is struck by the keeper, and suddenly roused to ferocity and activity, the character is seen not only in the glare of the eyes, the retraction of the lips, and the harsh sound of the breath as it is forcibly drawn through the confined throat, but every muscle is in tension, and the limbs in an attitude of strained exertion, prepared to spring. In this condition of high animal excitement, observe the manner in which the chest is kept distended and raised; the inspiration is quick, the expiration slow; and as the keeper strikes the jaw, there is at the same instant a start into exertion, and the breath rapidly drawn in." 190.

In the human subject, this passion is characterized by the clenching of the teeth, the sparkling of the eyes, the inflated state of the nostrils, the knitting of the eyebrows, the holding of the breath, the closing of the fist, and by the tension of the muscles in every part of the body and limbs. The expression is not confined to one part or feature; but it pervades, and to the practised eye is visible in, the whole frame.

The Latin poets are, on the whole, not very successful in describing the effects of Rage. Outcries and bellowings constitute almost invariably one

of the most prominent features of their portraits. *Virgil* has surely carried poetic license rather too far when he makes sparks of fire to burst from the mouth, as well as from the eye:

> "His agitur furiis, totoque ardentis ab ore
> Scintillæ absistunt; oculis micat acribus ignis.
> Mugitus veluti cum prima in prælia taurus
> Terrificos ciet, atque irasci in cornua tentat!"

In intense bodily Pain, as in Rage, almost every part of the body is in a state of convulsive excitement. The jaws are fixed, and the teeth grind; the lips are drawn laterally and the nostrils dilated; the eyes are largely uncovered and the eyebrows raised; the face is turgid with blood, and the veins of the temple and forehead distended; the breath being checked, and the descent of blood from the head impeded by the agony of the chest, the cutaneous muscle of the neck acts powerfully and draws down the angles of the mouth; the arms are outstretched, and the limbs are either convulsively contracted, or rigidly extended. One of the most striking features of the agony of Pain is a fixed and distended elevation of the chest. The object of this will at once be apparent, when we call to mind that the muscles of the arms—which are then, it is well known, instinctively thrown into the most violent action—arise from the chest. It is therefore necessary that their points of origin be immovable, in order that their other extremities, or insertions into the limbs, may act with the greatest amount of power: now this can only be done by the chest being kept continually fixed and expanded.

At the same time we must remember that, as long as the chest remains in this condition, no loud or prolonged cries can be uttered. "Hence," says our most ingenious author, "that most terrible silence in human conflict, when the outcry of terror or pain is stifled in exertion; for, during the struggle with the arms, the chest must be either expanded or in the act of rising; and therefore the voice, which consists in the expulsion of the breath by the falling or compression of the chest, is suppressed; and the muscles, which perform the office of raising and distending the chest, act in aid of the muscles of the arms."

The truth of these observations is beautifully illustrated by a reference to the famous group of "Laocoon and his Sons," now in the Vatican. Every one knows that this statue is justly considered to be one of the greatest achievements of Grecian Art. In the second book of the Æneid, *Virgil* has described, with his usual felicity, the terrible fate of the devoted priest. Already had the messengers of divine wrath encircled him with their inextricable folds:

> "Ille simul manibus tendit divellere nodos,
> Perfusus sanie vittas atroque veneno;
> Clamores simul horrendos ad sidera tollit:
> Qualis mugitus, fugit quum saucius aram
> Taurus, et incertam excussit cervice securim."

Mr. *Payne Knight* has, with no little acumen, censured this description in the following passage from his Essay on Taste.

"It is not with the agonies of a man, writhing in the pangs of death, that we sympathize, on beholding the clebrated group of Laocoon and his sons; for such

sympathies can only be painful and disgusting: but it is with the energy and fortitude of mind which those agonies call into action and display. For though every feature and every muscle is convulsed, and every nerve contracted, yet the breast is expanded and the throat compressed, to show that he suffers in silence. I therefore still maintain, in spite of the blind and indiscriminate admiration which pedantry always shows for everything which bears the stamp of high authority, that Virgil has debased the character, and robbed it of all its sublimity and grandeur of expression, by making Laocoon *roar like a bull;* and I think that I may safely affirm, that if any writer of tragedy were to make any one personage of his drama to roar out in the same manner, on being mortally wounded, the whole audience would burst into laughter, how pathetic soever the incidents might be that accompanied it. Homer has been so sensible of this, that of the vast number and variety of deaths which he has described, he has never made a single Greek cry out on receiving a mortal wound." 192.

Sir *Charles* approves of this criticism, so far as the artist is praised and the poet is blamed; but points out, at the same time, a fallacy in the critic's views, and shows that he has somewhat mistaken the aim of the artist. After admitting that he himself, upon examining the statue at Rome, was convinced that 'Laocoon' is represented by the sculptor as suffering *in silence,** he proceeds to observe:

"The artist did not mean to express 'energy and fortitude of mind,' or, by 'expanding the breast and compressing the throat, to show that he suffers in silence.' His design was to represent corporeal exertion, the attitude and struggles of the body and of the arms. The throat is inflated, the chest straining, to give power to the muscles of the arms, while the slightly parted lips show that no breath escapes; or, at most, a low and hollow groan. He could not roar like a bull—he had not the power to push his breath out in the very moment of the great exertion of his arms to untwist the serpent which is coiled around him. It is a mistake to suppose that the suppressed voice, and the consent of the features with the exertion of the frame, proceed from an effort of the mind to sustain his pain in dignified silence; for this condition of the arms, chest, and face, are necessary parts of one action.

"The instant that the chest is depressed to vociferate or bellow, the muscles arising from the ribs and inserted into the arm-bones must be relaxed, and the exertion of the arms becomes feeble. Again, in speaking or exclaiming, a consent runs through all the respiratory muscles; those of the mouth and throat combine with those which move the chest. Had the sculptor represented Laocoon as if the sound flowed from his open mouth, there would have been a

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* *Lord Byron*, we may presume, was of the same opinion; otherwise, the allusion to the sufferer's *patience*, in his celebrated lines, would not apply with truth:

"Or, turning to the Vatican, go see
Laocoon's torture dignifying pain—
A father's love and mortal's agony
With an immortal's patience blending:"

In his "Prometheus," also, he expresses a similar thought:

"A silent suffering and intense;
The rock, the vulture, and the chain,
All that the proud can feel of pain,
The agony they do not show,
The *suffocating* sense of wo,
Which speaks but in its loneliness."

strange inconsistency with the elevated condition of his breast. Neither is it correct to suppose it possible that a man struck down with a mortal wound, and rolling in the dust, like Homer's ill-fated heroes, can roar out like a bull. A mortal wound has an immediate influence on these vital parts and respiratory organs, and the attempt to cry aloud would end in a feeble wail or groan." 193.

The latter part of this beautiful quotation naturally enough leads us to notice the varying expression of violent death—as revealed not only in the features of the face, but also in those of the body generally—according to the nature of the struggles that have preceded the mortal agony. Let us take a few examples. How different are the outward marks of death induced by suffocation, from those in the body of one who has died from loss of blood! *Shakespeare* has described the first:

> "But, see, his face is black and full of blood;
> His eyballs further out than when he lived,
> Staring full ghastly like a strangled man;
> His hair upreared, his nostrils stretched with struggling;
> His hands abroad displayed as one that grasped
> And tugged for life, and was by strength subdued.
> Look on the sheets; his hair, you see, is sticking;
> His well-proportioned beard made rough and rugged,
> Like to the summer's corn by tempest lodged."
>
> *Henry VI., Part II.*

Contrast this horribly true picture of death from strangling, with that of Euryalus, who has fallen, pierced through the chest by his Volscian foe:

> "Viribus ensis adactus
> Transadigit costas, et candida pectora rumpit.
> Volvitur Euryalus letho pulchrosque per artus
> It cruor, inque humeros cervix collapsa recumbit:
> Purpurens veluti quum flos, succisus aratro,
> Languescit moriens; lassove papavera collo
> Demisere caput, pluvia quum forte gravantur."—*Æneid*, ix., 433.

Admirably does Sir *Charles* describe the convulsive agonies of the whole machinery of respiration, that precede death from hæmorrhage, in the following words:

"The 'Dying Gladiator' is one of those masterpieces of antiquity which exhibits a knowledge of anatomy and of man's nature. He is not resting; he is not falling; but in the position of one wounded in the chest, and seeking relief in that anxious and oppressed breathing which attends a mortal wound with loss of blood. He seeks support to his arms, not to rest them or to sustain the body, but to fix them, that their action may be transferred to the chest, and thus assist the labouring respiration. The nature of his sufferings leads to this attitude. In a man expiring from loss of blood, as the vital stream flows, the heart and lungs have the same painful feeling of want, which is produced by obstruction to the breathing. As the blood is draining from him, he pants and looks wild, and the chest heaves convulsively. And so the ancient artist has placed this statue in the posture of one who suffers the extremity of difficult respiration. The fixed condition of the shoulders, as he sustains his sinking body, shows that the powerful muscles, common to the ribs and arms, have their action concentrated to the struggling chest. In the same way does a man afflicted with asthma rest his hands or his elbows upon a table, stooping for-

wards, that the shoulders may become fixed points; the muscles of the arm and shoulder then act as muscles of respiration, and aid in the motion of the chest, during the heaving and anxiety which belong to the disease." 195.

This description is rendered the more affecting, by being accompanied with a beautiful drawing of this masterpiece of Ctesilaus, representing (as *Winkelmann* has justly said) "a wounded man dying, who perfectly expressed what there remained of life in him."

There is an interesting section in one of these Essays, in which our author suggests some strictures on the pictorial representation of "Demoniacal possession," or Convulsionary attacks, by those great masters of their art, *Domenichino* and *Raffaelle*. One of the frescoes, by the former, in the Convent of the Grotto Ferrata near Rome, represents Saint Nilus in the act of miraculously curing a lad that is possessed with a devil. "Convulsions have seized him; he is rigidly bent back; the lower limbs spasmodically extended, so that his toes only rest on the ground; the eyes are distorted, and the pupils turned up under the eyelids. This would be the position of opisthotonos, were not the hands spread abroad, the palms and fingers open, and the jaw fallen. Had the representation been perfectly true to Nature, the jaws would have been clenched, and the teeth grinding. But then the miracle could not have been represented; for one, under the direction of the Saint, has the finger of his left hand in the boy's mouth, and the other holds a vessel of oil, with which the tongue is to be touched."

In the famous Cartoon by *Raffaelle*, of "The death of Ananias," the effect would have been more impressive—if it was really the painter's intention to excite horror—had there been greater truth in the convulsions of the dying sinner, instead of a mere twisting of the body.

"In the same painter's great picture of the Transfiguration, in the Vatican, there is a lad possessed, and in convulsions. I hope I am not insensible to the beauties of that picture, nor presumptuous in saying that the figure is not natural. A physician would conclude that this youth was feigning. He is, I presume, convulsed; he is stiffened with contractions, and his eyes turned in their sockets. But no child was ever so affected. In real convulsions, the extensor muscles yield to the more powerful contractions of the flexor muscles; whereas, in the picture, the lad extends his arms; and the fingers of the left hand are stretched unnaturally backwards. Nor do the lower extremities correspond with truth; he stands firm; the eyes are not natural; they should have been turned more inwards, as looking into the head, and partially buried under the forehead. The mouth, too, is open, which is quite at variance with the general condition, and without the apology which Domenichino had. The muscles of the arms are exaggerated to a degree which Michael Angelo never attempted; and still it is the extensors and supinators, and not the flexors, which are thus prominent." 161.

However strictly true such strictures may be, in a pathological point of view, our author candidly admits that, "were the painter to represent every circumstance (of such an attack) faithfully, the effect might be too painful; something must be left to his taste and imagination."

With two or three remarks on the Expression communicated by the *eye* in certain states of the system, we shall close our notice of this charming volume—charming alike by its physiological expositions, its artistic illustrations, and its classical allusions and extracts.

"The *orbicularis* muscle of the eyelids acts powerfully in certain kinds of expression. In laughing and crying, the outer circle of this muscle, as it contracts, gathers up the skin about the eye; and at the same time it compresses the eyeball. A new interest is given to the subject, when we inquire into the object of that compression. It has a distinct relation to the circulation of the blood within the eye. During every violent act of expiration, whether in hearty laughter, weeping, coughing, or sneezing, the eyeball is firmly compressed by the fibres of the orbicularis; and this is a provision for supporting and defending the vascular system of the interior of the eye from a retrograde impulse communicated to the blood in the veins at that time. When we contract the chest, and expel the air, there is a retardation of the blood in the veins of the neck and head; and in the more powerful acts of expulsion, the blood not only distends the vessels, but is even regurgitated into the minute branches. Were the eye not properly compressed at that time, and a resistance given to the shock, irreparable injury might be inflicted on the delicate textures of the interior of the eye. Hence we see a reason for the closed state of the eyelids, and wrinkling of the surrounding skin, and twinkling of the eye, in hearty laughter." 106.

Whenever there is an actual or impending stupefaction of the system, the voluntary or *recti* muscles of the eyeball resign their action to the *oblique* muscles; the effect of which is, that the eye revolves upwards, and the white of the ball is exposed; at the same time, the *levator palpebræ superioris* yields, in sympathy with the oblique muscles, to the action of the *orbicularis* which closes the eye, and the eyelid drops. It is the struggle of the drunkard to resist, with his half-conscious efforts, the rapid turning-up of the eye, and to preserve it under the control of the voluntary muscles, that makes him see things distorted or double; and strive, by arching his eyebrows, to prevent the dropping of the upper eyelid. The puzzled appearance which this gives rise to, along with the relaxation of the lower part of the face, and the slight paralytic obliquity of the mouth, completes the degrading expression. In another passage our author beautifully observes: "There is sometimes in death a fearful agony in the eye; but we have said, that it is consolatory to know that this does not indicate suffering, but increasing insensibility. The pupils are turned upwards and inwards. This is especially observed in those who are expiring from loss of blood. It is the *strabismus patheticus orantium* of Boerhaave. Sauvages observes on this rolling up of the eyeball, in dying children,—'Vulgo aiunt hos tenellos suam patriam respicere.' 'The vulgar say, that these little ones are looking to their native home.'"

ON DIET, WITH ITS INFLUENCE ON MAN. Being an Address to Parents, &c., or how to obtain Health, Strength, Sweetness, Beauty, Development of Intellect, and Long Life. By *Thomas Parry*. Octavo, pp. 119. Highley. London, Nov. 1844.

To works emanating from regular practitioners, we have seldom seen a more *taking* title prefixed, than the one at the head of this article. The words "sweetness,' and "beauty," will attract the attention of a con-

siderable number of damsels and dandies, whose mirrors have sometimes raised suspicions in their minds respecting the sweetness and beauty of their precious persons. We are among the last to under-estimate the influence of diet on mind as well as matter—on health as well as on disease; but we cannot help suspecting that Mr. Parry has overdone his work in the following proposition:—"*take away from your nosology, fevers, miasmatic and contagious—surgical accidents and specific diseases, and may not nearly all the rests be traced to dietetic errors?*" Mr. Parry has left out the most efficient morbific causes of all—perturbations and anxieties of mind—nakedness and exposure to wet and cold—penury and destitution, &c.! The author of this little work has evidently many peculiar notions about diet, some of which are not very clear or tenable; but many of them are deserving of consideration. The book is divided into thirteen Chapters—some of which we shall notice.

I. *Birth to Weaning.*—Human milk is the proper nourishment for this period, and next to that, the milk of cloven-footed, and cud-chewing animals—especially the cow, whose milk ought to be diluted for young infants, and very little sugar added. The author has never seen any advantage from asses' milk, whether in health or disease. The milk of the ewe is very light and nutritious. "Corn and its products, flour and meal, is universally the just food of human offspring when making its separation from the mother." This is the same in all countries, and has been the same in all ages. Of the varieties of corn, wheat is the most nutritive—containing the greatest quantity of gluten and starch. The abundance of gluten in wheat renders that corn the most nutritive, but most difficult of digestion. The leavening of bread renders it more digestible.

"This leavening, however, is but one of the processes employed for rendering more digestible this dense nutritious food. It is afterwards baked, by which much more of the gluten is destroyed, it being rendered friable, and thus deprived of its gluey nature; and frequently this process is done twice to render the food still more light and easy of digestion. Bread thus prepared was formerly called *bis-cuit*, or twice baked. The term biscuit is now quite misapplied in general usage; the article to which the term is at present appropriated being an unleavened bread only once baked—a good and nutritious food, but not a light and easy digesting bread, as biscuit is." 9.

Wheat then being more difficult of digestion than other species of corn, barley is preferable for the young stomach, being the most mucilaginous.

"In the first months of infancy, if feeding be at all necessary, and corn be used, it should be either the light floury oat, or the diffusing starch (arrow root), or the mucilaginous rice. But if wheat food be preferred from prejudice or custom, then it should be leavened and biscuited, or twice baked—such are rusks, and tops and bottoms; these should never be burnt, although well baked, burning not only making them bitter and offensive to the stomach, but destroying also the nutritive quality of the corn. As the infant advances in age and strength, the degree of leavening and baking may be lessened: and, after a few months, baked flour, flour tied up and boiled in a cloth for several hours, biscuit powder, and leavened bread, may come to be used without so great a destruction of the gluten as had been before necessary." 10.

II. *Nine to Eighteen Months.*—The child being weaned, a more copious

supply of the light nutriment alluded to may be allowed. The milk may be less diluted—eggs may be sparingly used in pudding—weak broths may be allowed—but animal food is, as yet, improper. "But if a head-strong, self-willed, and bigoted person must indulge a fancied equality with some other child, who has been imprudently fed, then, in pity to the infant, let the meat be very small in quantity, very much cooked (not burnt) and cut into pieces not larger than a common currant." By these means, thinks our author, "the child will have a good chance of passing it off undigested,"—and "without other ill effect than having lost that nutriment which ought to have been given in its stead." In fine, he thinks that children from nine till eighteen months, should be fed on milk and farinacæ, with some eggs sparingly used. Light broth under particular circumstances. There is much good sense and wise counsel in these observations.

III. *Eighteen Months to Seven Years.*—Towards the close of the eighteen months, our author begins to relax in his farinalactic regimen, and indulges the young omnivorous animal in his carnivorous propensities. He is then running about. The mild nutriment is still to be continued, but "a small quantity of meat well cooked and cut small, may be commenced when the child has cut most of his teeth." This amendment, or rather adaptation of the diet may be gradually increased as the child advances in years. Neither wine, beer, cider, nor any fermented drink should be allowed. Under such regimen the child will be lively and inclined to exercise. Ripe fruit may be sparingly admitted to the table of the children at this period.

IV. *Seven to Fourteen Years.*—The growth of the body and the necessary exercises during this septenniad, require a "very plentiful supply of nutriment." The gluten of the wheat is now useful, and heavy substantial pudding may be taken with advantage, especially if the boy's digestion be strong. If the plain pudding lies heavy on the stomach—

"To obviate this evil, and yet avail ourselves of the sustaining gluten of the corn, strongly nourishing and digestible pudding may be made by mixing with the wheat flour, eggs, butter, fat, and milk, to which may be added sugar as a condiment." 20.

The use of fruit must still be sparing; and cheese, where it agrees, is very nutritious, but difficult of digestion. Beer and wine are unnecessary, except medically, and when taken should be diluted, so as not to produce exhilaration.

V. *Fourteen to Man and Womanhood.*—In this Septenniad, the growth of the body is still advancing—exercise is considerable, and the expenditure of education is to be supported. An abundant supply of good nutritious food is now indispensable. Discretion in butcher's meat and wine is necessary, upon the following grounds:—

"First, Too low a diet gives an apathy of character, with slowness of action, and weakness of body.

"Secondly, Too high a diet gives impetuosity of passions and temper, oftentimes with cruelty of disposition.

"Thirdly, A diet without exhilaration gives a gloomy tendency, with despondency, instead of buoyancy of spirit." 27.

This being the chief period in which the germs of consumption develop themselves, our author discusses the diet which accelerates or checks that fatal development. The Chistian differs from the Hebrew world, and all those who observe the injunctions of the Old Testament, by eating "meat with the blood." The Jews, Turks, Arabians, he says, who avoid blood and swine's flesh, "are infinitely more free from disease than the Christians —more especially do they escape those opprobria of the medical art, *scrofula*, gout, consumption, and madness." We doubt this statement; but, granting that it is perfectly correct, we do not draw the same inference that Mr. Parry does—namely, that such immunity is owing to abstinence from hog's flesh. We believe that Hippocrates was a better physician than Moses; and everybody knows that the Coan Sage spoke highly in favour of the flesh of the porker.

"The swine-fed navies of Christendom suffered greater devastations from a painful tubercular disease of the bowels, (dysentery), than from any other cause." 28.

The above passage induces us to think that Mr. Parry is not a medical man. The scorbutic dysenteries of seamen would have been cured, instead of being caused by pork, had it been fresh pork; but it was the *salt* beef and *salt* pork that induced scurvy and bowel-complaints. The author has a horror of black-pudding, and of fowls whose necks are wrung, and the blood left in them; but the swine's flesh is abomination! We think he must be an Israelite!

"If this important point be neglected in dieting for sweetness, strength, and beauty, and unclean food be substituted for that which is clean, then, 'it will come to pass,' as formerly said by Isaiah when the Israelites forsook their principles, 'instead of a sweet smell, there will be a stink; instead of well-set hair, baldness; and burning (inflammation) instead of beauty." 29.

We consider this opinion as a mere prejudice or superstition, without any foundation whatever. We agree with our author, however, in his next proposition, that all violent gymnastic exercises are to be avoided during the third Septenniad. The body is not strong enough, in fibre or texture, to admit of these experiments, and great mischief is annually done in the attempt. If the top of the strength be reached, it can never be held on in any living being, but is always followed by exhaustion and withering of the powers.

VI. *Exhilaration.*—This has the sanction of Scripture, the authority of profane history, and the consent of Reason. "Neither health, society, nor individual happiness, can go on without it." This dogma we much doubt, as far as wine is concerned in exhilaration. This term of our author, however, excludes intoxication—the use, and not the abuse, of wine, being the subject of Mr. Parry's eulogium. Mr. P. has a great aversion to bitters.

"And we now come to an exposition, why bitters came to be used in diet, when the Dutch had sent to us beasts' food to eat, and the natural consequence was experienced in stomach-pains, colics, and all the catalogue of gastric mise-

ries, which men relieved as well as they could by hot spices, spirits, ether, fetid gums, &c. The stomach of persons thus pained by improper food, and then eased by hot spices, then pained and eased again, soon continually became irritable or easily pained. Now, all bitter extractive, with very little or no exception, is deadening upon animal fibre; it is not narcotic, or sleep-giving, but directly deadening; it kills flies instantly, and shows its mortal powers very quickly upon most small animals; when much used in medicine, it too often proves fatal—as was the case some years ago with the Portland powder (a strong bitter), and as has been the case too often lately in the use of gentianine, and other very concentrated bitters. These things prove at first very deadening to stomach irritation in pain, relieve the patient from immediate suffering, but ultimately, if persisted in, deaden him altogether; although, from the absence of premonitory symptoms, the treacherous bitter is rarely suspected. The introduction of bitter into diet was, then, from the same people from whom we received the garden-food, so calculated to pain, irritate, and injure the stomach, experience having taught them its use upon their own badly nourished bodies—this bitter was the hop. It soon followed garden-stuff; and bitter extractive, in some form, has ever since been a portion of the drink, and a principal ingredient in doctors' stuff." 52.

The doctors come in for a share of Mr. Parry's ire against bitters.

"These hot condiments, and bitter drugs, and liquid fire, were not all that was needed; bowel-purges of all kinds came to be much wanted; and in the severe pains, frightful spasms, convulsions, and horrible distortions of anguish, which characterize the diseases now induced, those which purged most rapidly were most appreciated, whether from the poisonous mineral, the scouring wild plants, the griping gums, or the tormenting resins. And the great sum of stomachic physicking lay, and has since laid, in clearing the bowels, giving hot spices or aromatics, and drugging with bitter." 54.

The "cursed weed" meets with mercy in the hands of our author. "By this herb, the hungry cravings of an ill-nourished body are assuaged —the irritated nerves of an overworked man are soothed—and the wretched victim of a bad government indulges in dreams he cannot rationally hope."

Mr. Parry tells us that, before *mirth* can be brought out, *cheer* must be put in. The body should be well nourished, before the exhilarating materials are imbibed, otherwise even wine may fail to produce merriment.

"The degree of nourishing required, preparatory to exhilaration, is greatly beyond what the medical world has of late years deemed prudent. The system should have some degree of *embonpoint;* there should be a degree of fatness about the eyes, by which, when the person laughs, wrinkles are made on the outer sides of the orbit; the merry and cheerful man is thus easily discerned; and this is a leading feature known to characterists, or they who depict characters, whether painters or actors. A leanness about the eye, from which it sinks, and a flattened skin upon the prominent outer part of the orbit, is the sign of inanition, weakness, distress, and a leading outline of death, and also a never-failing mark of him who drinks instead of eats. 'Laugh and grow fat,' is a common phrase in England; but the order of events is the reverse, and the phrase should be 'Grow fat and laugh.'" 58.

Our author advises every man and woman to exhilarate with good wine, the genuine product of the vine, if possible—if not, with fictitious wine or fermented liquors from sugar-fruits, corn, or even sugar-roots—carefully avoiding all bitters. Next to wine, brandy, diluted largely with water, is the best drink. The catalogue of diseases from intemperance is frightful, but scarcely exaggerated.

"Should the badly managed man escape these palpable manifestations of disease, there is one suffering or blot in his being he cannot miss. He must inevitably become enervous, or enervated; that is, defective in courage, hesitating in decision, irresolute in action." 59.

Well, the farrago of anti-nervous and stinking medicines may be thrown to the dogs, or rather to the cats. "The only remedy is wheaten bread." "The only permanent tonic to the nervous system is corn." When, says our author, the divine, physician, singer, player, become nervous in their public exhibitions, it is because they doubt their powers and hesitate. "They who are well corned, like the highly-fed horse, doubt not." Finally, says he, "the great bulk of enervous cases are dependent upon insufficient corn." 61. Here is a new argument against the present corn-laws, and an excellent topic for declamation by the LEAGUE! We thus see that modern science has verified the old law, that "bread is the staff of life."

Our author disapproves of the old adage—"eat when hungry, drink when dry." Regular meals, he thinks, should be taken at regular periods, paying no attention to appetite. He is right. Much has been said, and uselessly said, respecting the quantity of our food. No two people require the same amount. Leave off before satiety, and eat slow. That sentence comprises the golden rule. The *quality* may be daily varied—but the *quantity* never exceeded. Rest after the meal of animal food seems necessary in all weakly persons. Digestion is much impeded by exercise.

"The combination of a late dinner and a heavy meat supper is fraught with apoplexy and many horrible effects, as nightmare, frightful dreams, &c. Further, the active man will find it imperative upon him to be systematic in all the parts of his dieting, and he will do well not to submit to temptations which may present themselves. Bread as often as he pleases in the morning, meat once in the even, exhilaration occasionally at night, is the system he must act upon. If the method be reversed, and exhilaration be made in the morning, he will frustrate all." 68.

The following passage is amusing, and there is much truth mixed with error in it.

"I shall conclude this portion of my writing by waiving all anatomical descriptions, all physiological discoveries, and all medical theories and hypotheses. The grounds excluding these are, that all stomachic theorists become dyspeptic; and the body corporate of physic, who have most of this knowledge, are the most dyspeptic portion of the people; that since Dr. Fordyce's clever book upon digestion, indigestion has increased wonderfully, and is still increasing. Anatomy, dating from Vesalius, has had little or no connection either with diet or physic in practice. The College of Physicians and Company of Apothecaries know this; inasmuch as they compel all students to study physic from Greek and Latin authors, who knew nothing either of anatomy or physiology. Experience, observation, and natural good sense, were sufficient to produce the greatest practical men we are acquainted with; and although, as a surgeon, I highly value anatomy, and, as a philosopher, I have an intense interest in physiology, chemistry, and other branches of the profession, yet, as a dietician, I know them to be worse than useless: for the slightest error in induction upon the facts of those sciences leads to errors fatal to strength, health, and life; and I have arrived at the conviction that a knowledge of the qualities of various articles of diet is more important than a knowledge of structure and function, because it alone involves the practice of the dietician." 69.

VII. *Labourers' Diet.*—To meet this hard, long, and fatiguing work, the labourer should make his prop or support the highest coarse corn of the country in which he lives—always preferring wheat. If it be what is termed heavy, close, compact, it may be a little more indigestible; but it will be nutritious. Still he imperatively demands and requires "*flesh*, for the temper of his body;" and, unless he obtains a fair proportion of this, he becomes a premature infirm old man. Swine's flesh, of course, is objected to by our author; but, under existing circumstances, it is impossible for the poor man often to get anything better than pork and bacon—not always even that! Our author recommends the labourer to eat very little salt with his meat, and if he can, to return to the old custom of his ancestors —" giving the zest or relish with sugar." For drink, he advises the hard labourer to use water—sugar and water—or sweet fresh beer." Bitters, of course, are prohibited.

"Neither should the labourer, when thirsty, ever drink hastily; it makes a man not firm in principle or act, to do thus. I have known several deaths from this error, and shall therefore persuade the labourer, when parched with thirst and tempted by a cooling stream, to lap like a dog, not draught it in like a cow." 75.

His toil over, the labourer may, if he can, exhilarate, but not get drunk, on good ale—especially of his own brewing.

"Under irritation or over-excitement, he may cautiously smoke tobacco, and *exhilarate when recovered;* but to smoke and drink together is tomfool's waste, and contrary to sound sense; tobacco being a sedative, and spirit a stimulant, and the combined effect generally intoxication, or poisoning, and sure poverty." 77.

VIII. *Active Professional Man's Diet.*—This man, whose mind and body are strained in the multiplicity of his occupations, will fail in health and powers, if he make not his dependence for sustainment, prop, or support, "upon a plentiful supply of wheat food." "The basis of an active man's diet must be corn." Soups and meat broths, however, are useful and nutricious, when used as condiments to bread. Our author does not approve of strong concentrated soups—weak broths are preferable. But, although he makes bread the staff of life among professional men as well as others, he admits the auxiliaries of meat, fish, game, &c. in moderation. We have only room for one more short extract.

IX. "IN DIETING FOR INTELLECTUAL ATTAINMENT, great support *should be made upon corn food*, while a very moderate tempering only should be given with meat. Exercise should be regular, but very short of actual fatigue. As great freedom of air should be given as possible, and sleep should be rather prolonged. Luther wrote his great work upon bread and water. Newton his work upon light upon bread and water, and Byron his best productions upon biscuit and water, and in Spain, the muleteers follow the mules forty and fifty miles a-day upon bread and onions or grapes. It is good food for the intellectual or not over-driven man." 118.

We have extended our notice of this little work farther, perhaps, than our readers may deem it necessary; but there is more of eccentricity and novelty in it than usually falls to the lot of much larger tomes that successively take their stand on our library table. Many of Mr. Parry's die-

tetic opinions are opposed to the generally-received dogmas of the Doctor and the public: but it does not follow that they are therefore baseless or erroneous. The book is well worthy of perusal, and we think some good advice is contained in it.

THE PRINCIPLES OF SURGERY. By *James Miller*, F.R.S.E. F.R.C.S.E. Professor of Surgery in the University of Edinburgh, Surgeon to the Royal Infirmary, &c. &c.

THIS work "contains the substance of the Author's systematic Lectures on this subject," and is "intended to exhibit a condensed view of the Principles of the Healing Art." Mr. Miller appears to have written it chiefly as a text-book, as well as of reference for his own pupils, yet hopes it may prove of service to others, "as a concise exposition of the Science of Modern Surgery."

Our brethren of the North appear to feel themselves called upon to show the professional world that the position of honour, to which they may recently have been elevated, has not been unworthily bestowed: thus among others, we have the two Surgeons from Scotland, now holding high office as Teachers and Hospital Surgeons in the Great Metropolis, shining forth as authors of works on Surgery; and, within a year or two afterwards, the subject of our present remarks appears. We strongly object to the too-prevailing practice of professional works being written solely for the sake of the author, the only justifiable reason—we had almost written excuse—for a medical practitioner to obtrude his work upon the public, is the conviction of its usefulness, and that such a volume is really a desideratum: this can hardly be conceded to both the works to which allusion has been made; and the mere mention of a third treatise on surgery from the same school, and within so short a period, certainly gave rise to some feeling allied to regret. This feeling was however completely removed by a reference to the book itself; for, while we found little more than detail, or practice, as it is generally termed, in Mr. Liston's and Mr. Fergusson's works, we here meet with general principles, with more expanded views of the real science of disease, doctrines upon which the details of practice may easily be engrafted; hence, although it probably will not be studied by the pupil preparing for his examination so readily as more practical essays, it will be received by the more advanced student and the practitioner as an important and valuable addition to his library, condensing, as it does, what is really known of pathology up to the present time.

Although we can speak very favourably of Mr. Miller's production, and strongly recommend it, not only to the perusal, but to the careful study, of all medical men, we shall take the liberty, in the review of the book, to apply our strictures, we hope in all fairness, where we think them due.

A "Historical Notice," that is, a History of the Progress of the Art of Surgery, which was written by Mr. Miller for the Encyclopædia Britannica, introduces the work. We have no objection to an occasional disserta-

tion upon the origin and advancement of our art appended to volumes, though professedly written upon its science or practice, inasmuch as we fear the medical student and practitioner are in general both sadly deficient in the literature of our profession, and not nearly sufficiently acquainted with the writings, or even the names of the worthies that have preceded us; we should, however, lament to have such an introduction generally imposed upon medical works as unnecessary and irrelevant. This sketch of the history of surgery is very well composed, and Mr. Miller has given honour where honour is due, and has restored the credit to some of the older surgeons, which it has been the unworthy endeavour of a few moderns to appropriate to themselves. A spirit of truthfulness and candour pervades this history, which is very refreshing. It was hoped that all attempts to maintain the unnatural and arbitrary divisions of medicine and surgery—at least so far as the *study* of the profession was implicated, whatever might be thought with regard to its *practice*,—were at an end, never to be revived, but the late recently chartered, and proposed legislative enactments, appear to have the tendency to perpetuate this baneful anomaly: with these impressions we read with gratification that "its (surgery's) complete separation from medicine would now be attended with the utmost difficulty; (would it not be impossible?) nor is it desirable that the attempt should be made, because its success, however partial and imperfect, would be most hurtful to both. They are now, and it is to be hoped ever will remain, one and inseparable. Their principles are the same throughout, and the exercise of their different branches requires the same fundamental knowledge; but their details are so numerous and intricate as to render it most difficult, if not impossible, for any one individual to cultivate all with equal success." "The separation, however, is not one of acquirements, but merely of practice. It should never be forgotten, that the physician, before he can be either accomplished or successful in his profession, must be intimately conversant with the principles, if not with the practice, of surgery. And most certainly no one can ever lay just claim even to the title of surgeon, far less hope for eminence or success, unless he be equally qualified to assume both the appellation and employment of the physician." We pass over the consideration of the historical notice the more readily, as Mr. Adams's translation from the Greek of the "Seven Books of Paulus Ægineta, with a commentary embracing a complete view of the knowledge possessed by the Greeks, Romans and Arabians, on all subjects connected with Medicine and Surgery," from which Mr. Miller has drawn some of his particulars, is or soon will be, in the possession of most of the profession, it being now in the course of publication by the Sydenham Society.

Our author has divided his work into four sections without intending, it is presumed, to convey a nosological arrangement. The first Section includes what he has termed "Elementary Disease;" this is subdivided into six Chapters, including "Perverted Action of the Bloodvessels," Inflamation and Congestion; "Perverted Action of the Nerves," Irritation, &c.; "Perverted action of the Absorbents" without inflammation; "Suppuration;" "Ulceration," including Granulation & Cicatrization; and "Mortification." The second Section treats of "Perverted vascular action in certain tissues;" first in the Integument; second, in Bone; third,

Diseases of the Joints; fourth, Diseases of the Arteries; fifth, of the Veins; sixth, Hæmorrhage; seventh, Affections of the Lymphatics; eighth, of the Nerves. The third section contains "Perverted Nutrition," which has one chapter on Tumours, Benign, Malignant, Encysted, and of different tissues. The fourth Section includes "Injuries;" first, Wounds; second, Burns and Scalds; third, the Effects of Cold; fourth, Fractures; fifth, Dislocations; sixth, Sprain and Rupture of Muscle and Tendon; seventh, Bruise.

Without saying that Mr. Miller has adopted the best arrangement possible of the principles of disease, we think the above is convenient to facilitate the student's study, beyond which we feel that the hitherto attempts at nosology are little more than useless, as, in the present deficiency of knowledge of the true essence of disease, such dove-tailing of one affection upon another cannot be made upon scientific principles. We cannot however recognise the improvement of interposing irritation, and simple absorption, between inflammation and its products; surely it is better to treat of diseases and changes in structure, which are known to depend upon each other, as nearly as can be consecutively.

The chapters on Inflammation and its consequences are the most important, from the perusal of which we have derived considerable pleasure and instruction. Mr. Miller defines inflammation as "a perverted condition of the blood and blood-vessels of a part interrupting its healthful function, and changing its normal structure; ordinarily attended with redness, pain, heat, and swelling; and inducing more or less disturbance of the general system." It is difficult to give an unexceptional definition of any disease, and of inflammation in particular; probably that by Galen, and which the above includes, is yet the most simple and comprehensive. Our author objects to the term inflammation being made to include simple increased action, which may, and often does, readily subside upon the removal of the cause, as well as the destructive disease which leads to suppuration, ulceration, and mortification; the "one," he says, "is something not at variance with health, the other is inflammation." Yet he states it is but "a transition gradually effected;" the condition of the blood-vessels is the same in the "blush of shame, or the red spot of hectic" as in the commencement of that inflammation which is to terminate in the destruction of the part, however much they may differ in the sequel. We prefer Mr. Miller's subdivision of the "transition into the three stages:— 1. Simple Vascular Excitement; 2. Active Congestion; 3. True Inflammation," to his objection, that they should be "declared the offspring of one common parent, inflammation." In simple vascular excitement, "the natural function of the part is exalted; if this be secretion, the secreted fluid is increased in quantity, yet with its normal characters scarcely, if at all, changed; nutrition is exalted; and the fibro-cellular tissue is fuller than before, giving slight increase of bulk. "This is not inconsistent with health, but rather its mere exaltation—synonymous with the *Vital Turgescence* of some physiologists. The part contains an increased amount of blood; its circulation is unusually active, and there is a marked tendency to increased exudation, partly serous, partly of a plastic kind." This very commencement of inflammation often exists in a more simple degree than described in the above quotation, and entirely subsides, or proceeds to disorganizing disease.

In "Active Congestion the vascular connection extends on the cardiac side of the affected part; the arterial trunks feeding it have partaken in the general excitement, are begun to enlarge, and are pulsating with an unwonted energy. More and more blood is sent down to the part, and the capillaries and minute arteries begin to give way beneath their burden; hitherto they were simply dilated, retaining their tone, and controlling the circulation of their contents; but now enlargement is about to be merged in over-distention, the vascular coats gradually parting with their tone." "The circulation loses its acquired rapidity, and becomes slower even than in health." Then is described the change which takes place in the blood, and Mr. Miller concludes—"Thus is constituted *Active Congestion;* the arterial trunks in increased play; the amount of blood in the part still farther augmented; its vessels beginning to be over-distended, and losing tone thereby; its circulation becoming slow; its blood undergoing change, the fibrin especially being increased, both in quantity and plasticity; function and nutrition perverted. We are leaving the confines of health, and have, indeed, already made some progress into the territory of disease."

"In *True Inflammation* the languor of circulation approaches stagnation, and at some points this has actually occurred; every part of the distended capillaries is occupied by crowded coloured and colourless corpuscles; partly, it may be, from increased attraction between the former and surrounding parenchyma, partly by accumulation and adhesion of the latter to each other and to the capillary walls. The altered liquor sanguinis is exuded in profusion. The capillaries also give way in their coats, and from the lesion blood is extravasated in mass. Suppuration is in progress by extra-vascular degeneration of the fibrinous effusion, or else by a secretive elaboration of it, ere yet it has left the vessel. Breaking up and disintegration of texture ensue, according to the extent of extravasation and suppuration; and the disintegrated texture is commingled with the effusion. The formative power has ceased, and the opposite condition, a tendency to disintegration, from diminution of vitality, has become established. Disorder of function is complete; secretion, for example, being in the first place arrested, and, when restored, more vitiated than before."

"The inflammatory change of the blood is important. 1. The liquor sanguinis is increased in relative quantity, and its serum is said to contain an unusual amount of albumen. 2. The fibrin is increased in quantity, both actually and relatively, to the red corpuscles; the vital attraction between its component particles, tending to aggregation, is also augmented. During active congestion its plasticity was increased, but now it becomes more and more aplastic. The proportion of serum is diminished, probably in consequence of effusion. 3. The red corpuscles are relatively diminished in number; and their tendency to aggregation is augmented. 4. The colourless or 'lymph globules' are greatly more numerous, but whether by new formation, or by mere accumulation in the part, has not yet been determined. They incline, not only to aggregation, but also to adhere to the sides of the vessels; thus increasing, or according to some, causing the tendency to stagnation of the blood." "This alteration of the blood, begun in the second, and completed in the third, or true inflammatory stage, is at first a local act, effected in the part inflamed; but this laboratory, if continued thus in operation, ultimately involves the whole circulating fluid in similar change."

These extracts will show the manner in which the Theory of Inflammation is treated; to illustrate the fact of the disease extending from the centre, Mr. Miller has furnished a diagram of three circles one within the other, the internal denoting Inflammation, the second Active Congestion, and the external, Simple Vascular Excitement. In reference to

the disputed question "whether inflammation is the result of an increase or diminution of vital strength in the part," the author states the fact "to lie midway between the disputants;" the action to commence with excitement, probably of short duration, to be succeeded by growing debility and much ultimate prostration. From which "a part once truly inflamed, never altogether recovers, but ever remains both more prone to action, and less able to control it: a fact which it is of much importance that both patient and practitioner should bear in remembrance."

While discussing the local symptoms, that of swelling is illustrated by a diagram similar to the one already alluded to, showing at a view the situation of the different effusions. Mr. Miller has not mentioned Hunter's experiment, nor his conclusion from it, that the heat of the inflamed part is not really raised above the natural standard, that it is only apparent; but describes this important condition as an established fact; we believe that John Hunter's experiment cannot be depended upon, nor consequently his conclusion, and that the heat, both apparent and real, is augmented in inflammation. Besides the four cardinal local signs, as originally laid down by Galen—Redness, Swelling, Heat, and Pain, the author has added Throbbing, Increased Sensibility, and Disorder of Function; the two first-named symptoms may be properly ranged under the head of Pain, being causes of that prominent sign, yet useful in the catalogue as denoting peculiarities of the pain and their causes; the throbbing arising from the mechanical impediment to the circulation of the blood increasing the pulsation of the arteries of, and leading to, the part; and the increased sensibility denoting the condition of the nerves. "Obviously this (latter symptom) is a wise and beneficial arrangement," "not only to suggest the propriety of rest, but also to compel its adoption. How lamentably destructive might not inflammation prove were it unaccompanied by pain and increased sensibility!" We rejoice to find more than usual stress laid upon "disorder of function"—a state in inflammation left by many authors rather to be understood than described, always existing and persistent to a greater or less degree through the progress of the disease, and often the first recognisable symptom.

In describing the Constitutional Symptoms, Mr. Miller adopts the opinion, that the buffed and cupped condition of the blood depends upon changes induced in the blood itself by the inflammatory process, an increase in the quantity, and tendency to aggregation of the fibrin and lymph-globules. We are hardly satisfied with the proof of the necessity of the positive alteration in the vital and physical characters of the blood, believing that the physical laws, when the vital or physiological are *slowly* withdrawn, are sufficient to account for the complete attraction of similar globules of the blood towards their own kind, and thus to perfect that separation with the more rapid coagulation of the same blood from a healthy individual prevents; in fact, possessing a higher amount of vitality, in consequence of the inflammatory fever, or over-action and innervation from any cause, it parts with its life, and consequently coagulates, more slowly, allowing time for the completeness of the separation of its constituents. Our author makes some short but pertinent observations regarding the character of the pulse in inflammation of different organs; a condition, we fear, too much neglected in practice, though of the utmost

importance, and generally taught in the medical schools. Mr. Miller very wisely guards the practitioner against officiously interfering to arrest a *critical* evacuation, when inflammation is likely to subside in consequence, as a profuse and sustained perspiration; a diarrhœa; a copious flow of "urine, more aqueous, less saline, at each evacuation less and less coloured, and, on cooling, letting down a large quantity of lateritious sediment, composed of urate of ammonia, more or less coloured by purpuric acid; or a discharge of blood from the rectum, the urethra, the mouth, the nose, according to the part affected." We allude to these critical discharges, not that we think they are frequent, but that when they occur, as undoubtedly they do, they are not sufficiently regarded, and malapraxis is often the consequence.

The results of the inflammatory process are elucidated by an "accompanying diagram, which, though both rude and fanciful, may assist to make them more plain. It will also illustrate the opinion held as to the gradual formation of the true inflammatory crisis." (P. 76.) These results are arranged under the heads of—1. Resolution, including Delitescence, and Metastasis, relative to which we have some good observations. 2. Excessive Deposit, by Exudation through the Vascular Coats yet entire; of Serum; of Plastic Fibrin; the organization of the latter requires a lower degree of action than true inflammation, as is corroborated by Mr. Dalrymple's paper. "But to all fibrin so organized, a general rule seems to be applicable, viz. that it is of low or imperfect organism, and, by consequence, liable to destruction in one of two ways; either by simple absorption, or by secondary action advancing to suppuration and ulceration. This is favourable; as regards the discussion or disintegration of simple enlargements of inflammatory origin, unfavourable, as regards reparations of solutions of continuity; and hence it is that the cicatrix by granulation —a process always preceded by true inflammation—is often undone, and the wound made gaping as before, while union by adhesion, or by the slow modelling process into whose composition true inflammation does not and cannot enter, remains firm and enduring." 3. Inflammatory Hæmorrhage and Extravasation. 4. Suppuration; many excellent observations occur upon the characters and formation of Pus; and upon the Constitutional Irritation so frequently accompanying Suppuration. "Pus may be regarded as a changed condition of the liquor sanguinius, consisting of globules, and small molecular particles, more or less numerous, contained in a thin serum. The serum is analogous to that of liquor sanguinis, the globules and molecules to its fibrin; indeed, there is every reason to believe that the globules are actually fibrin in a degenerated form. The formation may be either intravascular or extravascular." Our author thus holds the opinion of Sir E. Home, that pus is fibrin and serum changed in their characters, often after they have left the blood-vessels, sometimes previously to their escape. 5. Ulceration. Mr. Miller combats the Hunterian theory, that ulceration was the exclusive work of the absorbents. "Without denying that absorption, by both lymphatics and veins, goes on to some extent during ulceration, and that part of the destructive process may be so produced—yet there is every reason to believe that the major and more important part is effected, independently of that class of vessels." "The steps of the process are—1. True inflammation, with suppuration;

2. Softening of the truly inflamed part; 3. Its reduction towards a fluid form—a vital act more or less complete; 4. Disintegration, or death and detachment in minute portions, or molecules; 5. Mixture with pus, and removal in one common discharge. Pervading this process, there is some absorption; but the amount of that action is not only inadequate to effect the change, but is even below the ordinary standard of health." This account of ulceration differs widely from the ancient doctrines of corrosion, and solution. 6. Mortification. Mr. Miller gives an opposite account to that of the late Sir Astley Cooper, of the comparative extent to which the various structures of the limb will slough; the latter great surgeon, describing the separation to take place higher in the muscular than the fibrous, and, lastly, in the osseous textures, than in the skin, thus forming a good stump with ample integument; whereas, our author says, "But Nature's amputation is, unfortunately, a reverse of the ordinary operation; producing a stump conical, and otherwise but ill-fashioned for useful purposes. The surgeon is therefore called upon to interfere in most cases, to modify the arrangement, and secure division of the bone or bones at a higher point." The constitutional symptoms of mortification are given in an extract from Mr. Travers's philosophical work on Inflammation.

With the view of preventing the accession of inflammation immediately after the removal of the exciting cause, Mr. Miller prefers the steady application of cold and moisture to hot water or steam, which, though successful in subduing "the nervous excitement, or breaking off the first link in the chain, may be too great a stimulant to the second step of the initiatory process." Unhappily the medical practitioner rarely has the opportunity of applying his remedies during the early "incubation" of the inflammatory process. We cordially consent to the observations respecting the vast importance of the removal of the cause in the treatment of inflammation; no surgeon will deny its propriety; yet how frequently is it neglected! "Cases are on record of eyes having become pearly white and sightless, notwithstanding the induction of anæmia, dropsy, and mercurial disease—premature age and infirmity—by the attempts to save; all the while some small particle of foreign matter lodging undisturbed, and probably unsuspected, in the lining of the upper eyelid, whose simple removal might have saved both eye and system to the patient, as well as credit and conscience for the practitioner."

Some practical and excellent remarks on General and Local Blood-letting follow; the *tolerance* of bleeding and other powerful remedies induced in the system by disease should ever be borne in mind, and hence the extent of the antiphlogistic and sedative treatment is to be regulated by its effects, not by its amount: this tolerance, however, being much influenced by age, sex, temperament, acquired or cognate debility, &c. &c. We are gratified to find a full opiate recommended in the asthenic or nervous re-action from bleeding, having experienced great advantage from its administration; and, further on, that it is proposed to use it more extensively for its own direct influence, as well as to modify the effects of bleeding and of mercury. We have no doubt that the late Dr. Armstrong was justified in his predilection for opium in the treatment of inflammation, and we fear that he urged the use of the remedy upon the profession with

too little success; in some late instances of peritonitis after the extirpation of the ovarian cyst, it has been most beneficially employed, even without bleeding, and where the loss of blood was contra-indicated. Alluding to the occasional difficulty in reaching a vein for the purpose of bleeding in the usual sites, our author says, "it is to be remembered that a sufficient vein—the cephalic, is always to be found by a slight and sure incision, placed in the interspace between the deltoid and the clavicular portion of the pectoralis major muscles." "Hæmostasis, or temporary arrest of a portion of the blood, apart from the general circulation," is here quoted from the Maryland Medical and Surgical Journal, as having been proposed "as an occasional, or perhaps even frequent substitute for blood-letting; or, at all events, as a useful auxiliary. The blood of a limb, or of limbs, may be readily retained therein for some time, by deligation sufficient to arrest the venous return; and this may possibly have the effect of relieving the general circulation; the sluices being always slowly opened, so as to admit the gradual escape of the pent-up fluid. Such procedure is sufficiently ingenious, and not unpromising in theory; but it requires attestation by experience ere it can be recommended in practice."

Some useful remarks upon local blood-letting occur; among the precautions connected with the application of leeches, we would allude to the occasional apparent poisoning by the leech-bites; we say apparent, as it may still be doubtful whether all the cases of irritation and ulceration following the bites may not be referred to the condition of the skin to which the creatures have been applied: yet as most, and probably all, the animal fluids possess a tendency to excite disease in the recipient structure when predisposed, it is not too much to attribute many of the instances of severe irritation, inflammation and its worst consequences, to the direct poisonous nature of the secretion of the leech. Mr. Miller's experience differs from our own in the conception that opium is as readily absorbed from the rectum as when administered by the mouth. We are quite aware that dangerous, even fatal, narcotism has been produced, when opium in a fluid state has been administered by the rectum in doses similar to those given by the mouth; these cases we cannot but regard as rather exceptions to the general rule, and not as establishing it, and moreover, they have usually occurred in young children. We would not, however, weaken our author's warning, that "the dose should be the same, certainly not greater," but merely guard against disappointment, if the effect expected should not follow, and justify a quicker repetition of the remedy when applied by the rectum than when by the mouth.

The observations upon "the unsettled point whether heat or cold be the preferable application to an inflamed part," are very judicious, and, it is to be hoped, will assist in deciding this question, more important than may at first sight appear. Mr. Miller "believes heat and cold to be both valuable antiphlogistics, but that each has its own appropriate period for use, and that either, employed out of its proper time and place, will invariably do harm. The virtue of cold is chiefly as a prophylactic, diligently and carefully employed during the period of incubation." "Cold is found to be of use at both extremes of the inflammatory process—just before its accession, and subsequently to thorough recession; but, during

the actual existence of the action, it is inapplicable." *Heat* and *moisture*, plainly less suitable than continuous cold during incubation, are as plainly preferable during the inflammatory process." We must refer to the work itself for the precautions in applying these remedies. Our experience, and we expect the general experience of surgeons, fully confirm the author's laudations of nitrate of silver as an antiphlogistic, as well as a counter-irritant when more severely applied. It is wisely stated, under the head of counter-irritation, that "there is no more valuable remedial agent; none more frequently employed with the best results; but it must be rightly placed and timed; not too soon, nor too near, nor yet too far away." This class of remedies is arranged under three heads, Rubefaciants, Vesicants, and Pyogenic Counter-irritants: the latter "prove highly evacuant, by establishing from the artificially inflamed surface a more or less copious discharge of pus—that is, of the most important part of the blood for nutritive purposes, whether normal or perverted—its liquor sanguinis." Though Mr. Miller regrets "to find the indiscriminate and frequent use of the actual cautery threatening to return," he recommends its use in some affections as very superior to all other means, as "in advancing destruction of texture in the bones or joints," in chronic affection of some of the internal organs also—the kidneys for example." We cordially concur in the remark, that the cases which absolutely require the use of the actual cautery, are comparatively limited as to occurrence; "and for these, in the name of humanity, common sense, and propriety, let it be reserved."

Congestion, the second division of the "Perverted Vascular Action," is described as of two forms, Active and Passive. The first "may be a mere preliminary to the true inflammation; or it may persist as the minor grade, constituting a disease of itself." "Passive Congestion may follow on an imperfect resolution of the active form:" "or it may be original, unpreceded by excitement." "In the active form, the arteries and capillaries of the part are chiefly implicated—dilated, yet carrying on a tolerably vigorous circulation; in the passive, the capillaries and veins are mainly concerned—dilated, but with a circulation much retarded and depressed." The results of Congestion, more especially of the Passive State, are Resolution, Hæmorrhage, Serous Effusion, Inflammation.

The second chapter treats briefly of Irritation, "Perverted action of the Nervous System;" a subject hardly of second importance to Inflammation and its results. In describing the symptoms of "The Shock of Injury," Mr. Miller states that, "often the sphincters are relaxed, fæces and urine seeming to pass off involuntarily;" is this the condition as the immediate effect of the shock, or of the suspension or diminution of the action of the nervous system? In Lesion of the Brain, or of the Spinal Marrow, suspending its function, it is well known that, while the fæces pass off involuntarily, the urine is retained; a fact readily accounted for; when, however, the elastic tissues, as well as the muscles, are influenced by the general lowering of vitality, then, the retentive power of the bladder being diminished or lost, the urine dribbles away though the bladder may still be full; a circumstance not unfrequently mistaken by the inexperienced for incontinence.

"The shock of an injury may be considered practically as of two kinds—mental and corporeal." "There are many cases in which both forms of shock are more or less combined. For example, a man may be mortally wounded by an unexpected and unseen foe; the shock of the injury will be great, although entirely corporeal in its origin. A second may receive only a scratch, while he expected nothing but instant death; the shock will be serious, and may indeed amount to actual syncope; yet it is purely mental. A third may sustain a serious injury, from an assailant both seen and feared; the shock will probably be intense; mental and corporeal impression both contributing towards the lowering result. In such cases as the last, it is practically useful to ascertain, if possible, in what proportions the combination has probably occurred."

We have made this extract from the conviction of the great importance of this subject, and the fear that surgeons not unfrequently commit errors in practice for the want of its due study: the works on Military Surgery, in particular, teem with cases of moral and physical shock so extraordinary as to appear miraculous to the uninformed mind. Some valuable cautions are given against too early bleeding, and against too early stimulating; against interfering with Nature's "beautiful adaptation of circumstances to the attainment of an important and salutary event." Among the stimulants our author does not mention the hot-air-bath, a remedy more effective and more manageable than internal stimulants, and is immediately applicable in every poor man's cottage that contains blankets, bent rods or sticks, a large beer-funnel, and spirit of any kind.

In considering the "Perverted Action of the Absorbents," it is stated that "it is plain that the anormal state (of absorption) may depend either on excess of absorption, or on deficiency of arterial supply;" a conclusion not so plain as our author would wish it to appear. It is quite possible that the action of the absorbents may be but little, if at all, interfered with, and that the lessened nutrition may be the main, if not the sole, cause of undue absorption, as it is so called; this appears to be the more probable in "continuous absorption" from pressure, occurring without inflammation, and consequently without secretion of any kind, as the absorbent vessels are capable of resisting a greater degree of force than the blood-vessels, and particularly than the capillaries; hence, pressure is so much the more likely to affect mechanically the latter, than to stimulate (how?) the former. Here are some ambiguous observations on the contrast of absorption with granulation.

The fourth Chapter contains an account of Abscess, with some remarks on Scrofula. Mr. Miller states the Pyogenic Membrane (the lining of an Abscess) "to be endowed with very considerable powers of secretion; but as an absorbent surface comparatively feeble." A circumstance which seems to vary, as pus is known to be occasionally very quickly removed by absorption; but, as a general remark, the above is doubtless correct. He again notices the important fact "that the pus-globule, when extravascular and complete, is of comparatively large size, not soluble in its own serum, and therefore but little amenable to ordinary absorption; the serous portion may be taken up readily enough, but the solid probably remains little affected." Our author does not attempt to account for the process of *pointing;* as the abscess always proceeds in that direction offering the least resistance, whether towards the skin, or towards a mucous outlet, we are inclined to attribute important influence to the pressure

of the matter from within the cyst; and probably by interfering with the nutrition of the parietes in that direction. We cannot but conceive that many of the phenomena we are accustomed to regard as vital, are much more controlled and directed by mechanical operations than is usually supposed. We entirely consent to the remarks on the propriety of early opening an acute abscess; and regret that in some medical schools the opposite treatment is taught; it is quite certain that Nature is sometimes equal to the task of removing the pus by absorption, but this is so rarely met with, that, in the treatment, a judicious surgeon would not reckon upon it; further, in the instances which have fallen under our notice of successful attempts to produce absorption, and thus spare the lancet, the injurious effects of the remedies upon the system at large were any thing but encouraging to a repetition of the practice. When for the sake of removing attenuated skin, or to destroy obstinate glandular enlargement, or in consequence of the patient's objection to the knife, the evacuation is performed by the caustic, our author prefers the "potassa fusa pressed firmly on the part, till the abscess is entered—moved laterally also, if need be, to destroy integument—or pushed deeply, to break up glandular enlargement."

Mr. Miller says, "it is probable that, in the truly chronic abscess, enlargement of the suppurated space never occurs by ulceration, but is effected merely by condensation, and by interstitial and continuous absorption of the surrounding parts; unless, indeed, acute accession supervene." An excellent mode of evacuating the contents of a large chronic abscess is described; the ordinary manner of opening these large cysts is often productive of considerable danger by the supervention of acute inflammation of the sac; though at other times the moderate excitement occasioned is productive of benefit.

"An abscess is said to be diffuse, when the suppuration is not surrounded and limited by plastic fibrinous effusion; and when consequently the pus—in such circumstances of a thin, apparently unhealthy, and probably acrid nature—is so soon as formed readily infiltrated into the surrounding texture, open and unprotected;" is this correct? is it not rather that the cyst formed in the usual manner, but in the chronic form, is thin and attenuated, and in consequence of pressure of the pus or of external accident, it gives way more or less suddenly, and the fluid extravasates into the surrounding cellular tissue? or that, in some cases, the sac becomes altogether absorbed, and hence, not being discovered upon examination, is supposed not to have existed? this is a more probable account than Hunter's of his "Collections of Matter without Inflammation:" we grant that suppuration may occur so rapidly, in cases where the exciting cause is extreme, as in extravasation of urine, as not to afford time for the formation of the cyst; but these are instances of the most acute suppuration, and not very frequently occurring, as the excitement is usually too great for suppuration, and mortification results.

We are favoured with some good, though brief, remarks upon Scrofula; Mr. Miller adopts the views of Carpenter, Bennett and others, and now generally received, that this baneful disease is one of perverted nutrition, the albumen prepared by digestion is not converted into fibrin, "hence albuminous tubercle is deposited in the interstices of the tissues, instead

of these tissues being themselves regenerated by organizable fibrin." "The inflammatory process, occurring in one of a strumous habit, may be accompanied by rapid and extensive deposit of tubercle instead of the ordinary plastic exudation."

The fifth Chapter, under the heading Ulceration, treats of Granulation, Cicatrization, and the different forms of Ulcers: the observations on Granulation would almost lead to the inference, that the lost texture was truly reproduced, a supposition with which we cannot concur, but would agree with the quotation from Mr. Travers, in speaking of Cicatrization, that "the new formation is only a copy, and like all copies, inferior to the original:" we doubt whether any texture is really reformed by granulation; the organized fibrin, however, constitutes an admirable substitute in most instances, but still a substitute.—Mr. Miller allows the possibility of cicatrization to take place from granulations themselves independent of the original skin, but considers it a very rare circumstance.

We would impress upon the medical student the moral bearing of the introductory remarks to Ulcers, the very opprobria of surgery, more important than most diseases that fall under the notice of the surgeon,—in consequence of their great frequency, general difficulty of cure, affecting, for the most part, the legs of the labourer, who cannot afford to maintain the rest and position often so necessary to cure—yet frequently neglected in their study, and passed by as of secondary importance.

"The following classification will be found to include the great majority of ulcers. Under one or other of the varieties, every example may be arranged; or, if the exact type be not there, it will be found somewhere intermediate, and easily deducible therefrom. 1. The Simple Purulent, or Healthy Sore. 2. The Weak. 3. The Scrofulous. 4. The Indolent. 5. The Irritable. 6. The Inflamed. 7. The Sloughing. 8. The Phagedænic. 9. The Sloughing Phagedæna."

Mr. Miller often alludes to the efficacy of the water-dressing, medicated or not, in the treatment of some forms of ulcer, and especially advocates the free use of "potassa fusa in solid substance," to remove the unhealthy infiltrated cellular tissue in the scrofulous sore, "so as to destroy thoroughly not only the cellular tissue where tuberculated, but also the integument where thinned, blue, undermined, and obviously incapable of recovery." "It is, avowedly, a painful process, but most effectual; indeed, according to my experience, altogether indispensable towards obtaining a satisfactory cure." Thus is strongly recommended the practice some years ago urged by Mr. Lloyd. The Indolent Ulcer, most frequently occurring in the lower extremities of the old and unhealthy, who, at the same time that they have borne more than their share of this world's labour, have enjoyed less than their fair proportion of this life's comfort, or even nourishment; support and pressure by bands of plaster and rollers, introduced by the late Mr. Baynton, of Bristol, are recommended as the best means of restoring a more healthful action, and tending to granulation: but perhaps hardly sufficient stress is laid upon this indispensable treatment; which, even when incapable of inducing the curative process, is often sufficient to retard the progress of the disease, and to render a limb, though ulcerated, useful for the purposes of even laborious exertion, and free from pain and distress.

In the treatment of the Sloughing, Phagedænic, and Sloughing-Phage-

dænic Sore, Mr. Miller advocates the use of "severe and active remedies—escharotics—at the outset, in order to cut short the disease, and along with the suitable constitutional treatment—to change the character of the sore into the healing type," in preference to the "lenient measures—poulticing, rest, and expectancy." Nitric acid undiluted is the remedy our author freely applies; when the eschar has separated, if the slightest appearance of phagedæna continues, the escharotic is to be renewed; he considers, however, that the nitrate of mercury is preferable in the re-applications, "not as a more efficient escharotic, but as a more successful *alterative* of the nature of the sore." It is stated "that this class of sores is communicable by contagion;" is this really the fact? that many, perhaps most, sloughing ulcers are specific, and consequently contagious, we will admit, but are hardly prepared to receive the above dogma, as respects sores arising from common causes, and assuming the phagedænic character, in consequence of a debilitated or strumous constitution, or from untoward external circumstances. The Varicose, and the Menstrual Ulcer, of some authors, are regarded as conditions or peculiarities, which may attend every variety of sore.

Mortification occupies the sixth Chapter. In treating of the causes of this extreme result of Inflammation, Mr. Miller has an interesting extract or two from Baron Larrey's famous work, showing that mortification is, in by far the majority of instances, the immediate effect of re-action from severe cold, and not the effect of cold, although long endured, and even fifteen degrees below zero of Reaumur's thermometer. We are gratified to find allusion made to the influence of mercury, as predisposing to sloughing; and we incline to the belief as producing the immediately exciting cause in many cases: we would that this fact were more constantly in the minds of those practitioners who recklessly abuse this valuable medical agent. Mr. Miller does not regard Arteritis, terminating in consolidation of the vessel, as a frequent cause of the death of a limb, large or small; and, although he would not deny its possibility, seems to regard it more reasonable to attribute it to the diseased action "having invaded, not the arterial tissue alone, but the whole part." Hardly feeling justified by experience to regard, with Dupuytren, adhesive inflammation of the arteries as the most common cause of gangrene in the extremities, we are quite convinced it is far from infrequent; we believe that this cause was first pointed out by the late Mr. Grainger, sen., of Birmingham, who detected it in a soldier of his regiment, when quartered in Ireland; further investigations brought more proofs; since which time they have been multiplied; the most interesting case of the kind which has fallen under our notice being that of Mr. Crisp, in which the great trunks of both the upper and lower extremities were more or less consolidated; one, if not two, completely so, in a young girl, to all appearance healthy, with this exception, and that of the resulting mortification. Our experience does not coincide with the author's that Senile Gangrene "is most liable to occur in males, of the higher ranks, and who have indulged freely and habitually in the pleasures of the table," as we have witnessed the disease much more frequently in the lower orders, who have freely indulged in spirituous liquors, and have been much exposed to wet and cold, being now, in their old age, badly fed and badly clothed; the diseases, however, to which the

two extremes of social rank are predisposed are very similar, for the habits, when an unchecked license is given to sensuality, though apparently the very reverse from each other, tend to the same unhappy result.

Mr. Miller very justly guards his readers against false diagnosis, against mistaking the serous vesicles of bruise for the phlyctenæ of mortification, an error not likely to occur to the well-informed surgeon, but which has happened to the less accomplished. Many cases of mortification from pressure, or *bed-sores*, would be avoided by the more constant use of "that admirable contrivance, the hydrostatic bed, by which the labour of support is equally distributed on every part of the surface;" the reddened and painful parts being at the same time "pencilled over by nitrate of silver, either in substance or in solution, so as merely to blacken the integument, carefully avoiding the vesicating effect." The old and empirical practice of rubbing the frost-bitten foot with snow, while the patient and part are yet in the open air, and upon the success of which the disciples of Hahnemann partly found, though falsely, their doctrines, "ensures the reaction being gradual, slow, and safe." We are favoured with some good remarks upon the middle course of general treatment, avoiding stimulation on the one hand, and spoliation on the other. Among the local, as well as the general remedies for mortification, Mr. Miller, very properly, denies there are such remedies as antiseptics; those applications which were so imagined are all stimulants, and for the most part injurious as such; the chlorides are useful when applied to the decomposing parts, as correctives of fœtor."

Mr. Miller concludes the important question of Amputation in mortification, concerning which so many contradictory opinions have been entertained, with this admirable summary:—

"Thus, then, when gangrene is acute and humid, dependent on an external cause, and unconnected with a previously existing failing of system or organic change in the general limb, we amputate, if at all, during the progress of the disease, without waiting for a line of demarcation. When it is chronic and dry, dependent on an internal cause only, or on internal more than on external causes, and connected with failing of both general and local vital power, we wait for the line of demarcation, watch the progress of separation—cautiously supporting the system meanwhile—and when detachment is far advanced, we interfere merely to facilitate and modify its completion; we amputate in the line of separation. When gangrene is the result of one particular external cause, cold, we await the line of demarcation; and, so soon as that has been fairly formed, we amputate, either there or above, according as circumstances may seem to require."

Having noticed at considerable length the Section containing inflammation and its results, we may be excused for making brief allusion to the remainder of Mr. Miller's book; the more so, as complete treatises upon the subjects are not to be expected in a work professedly upon the Principles of Surgery.

The seventh Chapter, the first of the second Section, describes Erythema, Erysipelas, Hospital Sore, Furunculus, Anthrax, and Diffuse Cellular Infiltration. Mr. Miller has described five varieties of Erysipelas, the Simple, the Phlegmonous, or Cellulo-cutaneous, the Œdematous, the Bilious, and the Erratic; and in addition, the Hospital Erysipelas. Such

division may facilitate the recollection of the forms and degrees the disease may and does assume under peculiar conditions, but beyond that it has a tendency to mislead the student into the expectation that the varieties are different affections. We entirely concur in the general treatment of this troublesome, and often dangerous complaint, and especially in our author's laudations of punctures and incisions judiciously performed, and at a period judiciously chosen. The question of the contagious nature of erysipelas is wisely left open, with the recommendation that every precaution against communication should be taken. We, however, entertain no doubt of its non-contagious character, though in the crowded wards of a hospital, particularly in those appropriated to accidents and operations, it frequently presents an apparent even infectious nature; a circumstance, however, more legitimately accounted for by the general contamination of the atmosphere, and the peculiar disposition of all the patients there domiciled to be affected by this very complaint.

Mr. Miller writes that Hospital Gangrene "is an example of sloughing phagedæna, it may be produced directly by contagion, more indirectly by infection; or it may occur independently of either—from crowding, evil dressing, or noxious atmospheric influence. Mercurialism is especially favourable to its accession. It may either seize on a wound already existing, or appear in a part previously entire." As "hospital erysipelas and hospital sore may be found to co-exist," which we believe to be of frequent occurrence, and that one often runs into the other, are they not both subject to the same laws of origin, and may not the same doubt of the contagious or infectious nature of the one apply with equal propriety to the other? It is stated that "the constitutional symptoms of Carbuncle or Anthrax are asthenic throughout; at first of a simply febrile and bilious character; then showing typhoid signs:" our experience does not confirm this statement; we have seen carbuncle occur in the over-fed and plethoric, and accompanied by inflammatory symptoms requiring mild antiphlogistics, though the reverse is its ordinary character. Usually, "Diffuse cellular infiltration is connected with the inoculation of a specific virus." The bites of reptiles, stings of insects, and punctures received during dissection, are familiar examples of such exciting causes." "Urine infiltrated into the cellular tissue is certain to light up an asthenic and rapidly destructive inflammation there." It is an interesting fact, to which allusion is not made, that the danger to life in extravasation of urine is proportional to the extent of destruction of the skin, a very extensive sloughing of the cellular membrane may occur, and the recovery be tolerably certain in a previously healthy individual, but if the integument slough to a similar, or even less extent, a fatal issue is to be expected; hence the utmost importance of free and early incisions through the skin.

The "Perverted Vascular Action occurring in Bone," is considered in the eighth Chapter. We prefer Dr. Cumin's arrangement of this important part of pathology to that before us, as being more simple, and more intimately allying the usual changes in the osseous structure with the producing inflammation. Our author treats these diseases under the heads of Periostitis, Ostitis, Suppuration, Absorption, Ulceration of Bone, Caries, Necrosis, Fragilitas Ossium, Mollities Ossium, Rickets.

"Examples are not wanting of the whole skeleton having been involved

in periostitis;" happily such extent of this direful affection is rare, though we have seen, too frequently, the vastness of its frightful ravages. Mr. Miller properly attributes much blame to the abuse of mercury, and says truly, that "the worst cases are those which occur in scrofulous patients, who have suffered from both syphilis and its supposed specific." Let it not however be inferred that we doubt the specific properties of mercury for the cure of syphilis; it is the abuse of this valuable medicine, and its non-regulation in accordance with the exact form of the disease, and more especially with the constitutional peculiarities of the patient, and the circumstances surrounding him, to which we would refer as inducing the various forms of mercurial disease.

Allusion is made to the Periosteum being sometimes the seat of neuralgic affection; it may follow amputation, or slight injury; requiring rest, the endermoid application of nitrate of silver, and the internal use of tonics, &c.

The result of Ostitis "may be suppuration, internal, external, or general; ulceration, simple or carious; local death or necrosis. Or the action not reaching true inflammation, and imperfectly resolving, there may be simply change of structure." The "change of structure" is the hyperostosis of Dr. Cumins, in which the bone is at first softened as well as enlarged, and apparently porous, afterwards condensed and indurated by excessive deposit of earthy matter.

Suppuration originates in the bone or extends to it from the periosteum and forms abscess, internal or external, acute or chronic: the internal abscess being also *diffuse* or *limited*. Mr. Miller, in our opinion judiciously, urges the adoption of free incisions to allow the matter to escape as readily and as easily as possible, and the internal abscess to be opened by the use of the trephine if necessary, as proposed by Sir Benjamin Brodie; by which active treatment necrosis and exfoliation is often prevented, the suppuration limited, and the limb saved. We have described the "Scrofulous or Tubercular Abscess of Bone," and also "General Suppuration of Bone," in which "the abscess is neither external nor internal, but diffuse, pervading the whole thickness of the bone, and invariably acute; the result of intense general ostitis," "in fact the case is one of acute Necrosis."

"Absorption of Bone is more or less connected with perverted vascular action, but altogether independent of true inflammation." It is interstitial or continuous: of the former we have examples in the commonly named "white-swelling," and the wasting of the bones; of the latter, in the effects of pressure from aneurism, abscess, or solid tumours.

Mr. Miller describes two varieties, or rather degrees of Ulceration in Bone; the Ulcer, which is simple and tractable; and the Caries, which is peculiar and difficult of cure. The Ulcer is the product of true inflammation, as in the analagous condition of the soft tissues." The Caries "is something more than a weak ulcer of bone; it is something less than a malignant or cancerous sore, as it is too often designated." It may be "simple, or of a scrofulous or tubercular character." Our author objects, and with reason, to the indefinite use of this term Caries; it is generally used to imply every ulcer, or even absorption of bone, whether of the skeleton in general, or of the tooth, whether arising from a common or a specific cause, whether terminating in the destruction of the bone, or

healing by granulation ; we can hardly object to its use as a generic term, though we certainly should if it were intended to convey any peculiarity, or the want of peculiarity, in the disease.

Necrosis is most "frequently the indirect result of injury, the bone perishing by an overpowering inflammation ;" it is simple when unaccompanied by any other form of disease ; compound if combined with caries, or attendant on fracture. It is also traumatic when arising from injury ; idiopathic when originating without any appreciable exciting cause. The extent is very various, hence we have exfoliation, the death of a mere scale of bone ; or the cancellated interior may perish alone ; or the whole mass may die, forming general necrosis, an unusual circumstance, as the articulating extremities generally escape. Mr. Miller divides the process of Necrosis into stages : first, "the bone, or portion of bone, inflames :" second, "the bone dies :" third, "the dead portion is separated from the living ;" fourth, "separation of the dead portion is completed." Are not these two stages one and the same ? fifth, "the dead portion is extruded ;" sixth, "reparation is completed." The important practical fact is generally, but not universally, acted upon, that a bone denuded of its periosteum does not necessarily die ; its destruction depending upon the extent of succeeding inflammation. The injurious consequences of interfering with the sequestrum, in all cases, "before it has become loose," cannot be too strongly urged ; much evil, we are convinced, is daily produced by the attempts, generally and fortunately too unsuccessful, to pull away the bone before its separation from the healthy texture. We rejoice in the opinion that "amputation is rarely demanded in necrosis ; that it is the exception, not the rule." The medical philosopher is probably more gratified at the wonderful operations of nature, in restoring a necrozed bone, and removing the sequestrum, than in most of the other resources of the vital power : and we regret that we cannot make further observations upon the text before us, or extract more largely ; we therefore refer the reader to the work itself, promising him ample reward for his pains.

Fragilitas Ossium ; is it quite certain that this affection of the bones really exists ? the varying proportion of earthy matter at different periods of life renders the bones more or less brittle, and consequently more liable to fracture ; and, without denying that over-deposit of bone-earth may occur, producing disease, we think the examples reported may be more truly referred to other conditions of the bones, as ulcers, common or specific, malignant deposits, softening, &c. &c. The opposite state, Mollities Ossium, or Osteomalakia, is a really formidable disease, happily not of great frequency, yet every surgeon of practice must have witnessed several examples ; we have lately seen a case in which every bone of the skeleton appeared to be affected, those of the extremities being bowed according to the pressure, and the pelvis and shoulders being distorted from lying, when the recumbent posture became inevitable.

In describing Rickets, our author says, "the bone is found changed in structure, much in the same way as in fragilitas ossium ; but instead of a brittle condition, the result is softness and pliability ;" surely this disease is more allied to mollities ossium ; it is the softening of bone in the young, one result of a scrofulous diathesis. Mr. Miller recommends light mechanical support as necessary for the spine ; this must be applied with

great caution if at all; we have not the great dread of taking off the weight from the skeleton by means of the recumbent posture strictly maintained; the pressure is the exciting cause of the deformity, the constitutional deficiency, the cause of the mal-construction of the bones; either cause, if neglected, will operate upon the other, the latter more effectually; and conceiving that both indications might be successfully attended to, we have followed the plan they have suggested, and with satisfactory and gratifying results.

The ninth chapter is a short dissertation on the all-important Diseases of the Joints, which were at one time all inconveniently included under the designation "White-swelling." Mr. Miller "considers, in succession, the results of the inflammatory process in the different component textures of the joints; 1. In the Synovial Membrane; 2. In the Cartilage; 3. In the Bones. Synovitis is Acute, Chronic, and Scrofulous also Chronic. "The Brown Intractable Degeneration of the Synovial Membrane," Mr. Miller thinks, is allied to Carcinoma, and if it be not malignant at the onset, very liable to become so; we would consider this peculiar affection as originating in a scrofulous rather than a carcinomatous tendency, which opinion does not preclude the supposition of it eventually assuming the malignant character under favouring circumstances. It is described as an affection which can only be meliorated at its very commencement, afterwards the limb, or later, the life, of the individual must be sacrificed. "The Fimbriated Synovial Membrane" is a rare affection, and the history of it is taken from Mr. Liston's Elements of Surgery.

"The Inflammatory Process in the Exterior of Joints," is intended, we suppose, to express inflammation in the various fasciæ and cellular membrane external to the joint, whether arising from common causes or from rheumatism, and often endangering the joint in its result.

"Tophi:" "these are concretions (of Urate of Soda) connected with the extreme articulations, more particularly of the fingers." Although these deposits are alluded to here in connection with the diseases of the joints, they are far from being peculiar to the articulations; and, when they are found in their vicinity, we conceive them to be symptomatic of the general rheumatic or gouty diathesis, and are there located in consequence of the fibrous tissue, to which structure they appear to be confined; if one part of the body be especially liable to these concretions, we are inclined, from our experience, to name the Fascia Lata; we have lately witnessed the unusual case of a child eleven years old suffering from acute rheumatism with deposits of Urate of Soda in the fascia of various parts, the first and largest and most numerous being in the back part of the scalp or tendon of the occipito-frontalis, then in the forehead, arms, legs, feet, &c. as well as near the large joints; there was, and still exists, deposit, perhaps of a similar character, in the mitral valve; the external tophi having been absorbed, furnishes an increased hope that a similar result may occur in the heart. Mr. Miller, however, speaks of them as incapable of being absorbed, which we conceive is opposed to general experience. Benzoic Acid has lately been proposed as an internal remedy, with the view "of converting the uric acid into the hippuric acid," the hippurates being comparatively soluble.

The history of "Destruction of Cartilage" is valuable; it is arranged as 1. "Simple Destruction or Ulceration." 2. "Scrofulous Ulceration of Articular Cartilage." Cartilage is also subject to "Hypertrophy" from over-nutrition; and to "Atrophy," the consequence of over-pressure, hence chiefly met with in old persons. "Porcellanous Deposit" may be the result of ulcer in the cartilage. "Osseous Deposit exterior to the Articulation," results from rheumatism, especially affecting the periosteum. "Interstitial Absorption of Bone implicating the Joint," is a frequent occurrence of great importance, constantly predisposing to fracture, and often mistaken for it: it is the effect of old age, especially in the hip and shoulder joints of females consequent upon the well-known anatomical peculiarities. Mr. Miller describes three modes by which "Loose Cartilages (?) in the Joint" may be formed, a problem, perhaps, not yet satisfactorily solved. We have detailed the improved "subcutaneous and valvular punctures" into the synovial capsule for their removal, as proposed by Mr. Syme, Mr. Goyrand, and also by Dr. Duncan.

"Articular Ulcer," and "Articular Caries" are alluded to very briefly; for the latter, the "Re-section of Joints" is occasionally demanded. We may be permitted this opportunity of congratulating the profession and the public for this important addition in the present day to our chirurgical appliances; by which not only a limb, but a useful one, may occasionally be preserved; we must, at the same time, regret that this improvement has been subjected, like others, to the customary abuse in practice.

"Anchylosis is said to be of different kinds." 1. Osseous or Complete. 2. Ligamentous. 3. Spurious, occasioned by extensive fibrinous deposit exterior to both joint and ligaments. "Neuralgia of Joints," and "Wounds of Joints," conclude this part of our author's subject; with slight allusion to "Affections of Bursæ," and "Affections of Thecæ," including "Bursitis, Acute and Chronic; loose bodies therein contained, and Ganglion."

The tenth Chapter treats of the interesting "Diseases of the Arteries." Arteritis is described as Acute and Chronic; the former subdivided into the "Spreading" and the "Limited." "The Calcareous Degeneration" is very different from the state of inflammation.

"Aneurism. By this term is meant a pulsating tumour; composed of a cyst which is filled with blood, partly fluid, partly coagulated, and whose cavity communicates with the arterial canal." This definition is not unexceptional, nor does it appear to be an improvement upon that of the late Sir Astley Cooper. Our time and space will permit us only to enumerate the divisions of this interesting disease adopted by Mr. Miller, who still describes it as True and False, terms which, having been adopted before the anatomy of aneurism was really understood, were intended to imply what did not occur; a circumstance, however, of little importance, if the present definition be always understood. True Aneurism is "the result of disease; the tumour being formed by dilatation, or by either rupture of the coats or their ulceration from within, or by a combination of both circumstances; and the cyst, consisting of one or more of the arterial coats, yet undivided." The term *false*, on the contrary, denotes those aneurisms, in which the arterial tunics have been wholly divided, either by wound, or by ulceration from without, and form no part of the aneurismal cyst.

These constitute the minority, the former the majority, of the cases of aneurism." We entertain the opinion, that in many cases of the so-called True Aneurism, the whole of the arterial tissue has been removed, the cyst being entirely newly-formed from the surrounding texture and organized fibrin. The True Aneurism is formed "by dilatation," by "dilatation and rupture," by "rupture." The varieties are the Dissecting and Pedunculated, as also limited or diffuse. False Aneurism may result from a direct wound; from laceration; or from ulceration from without, as from an abscess; as an example of the last mode of formation, Mr. Listōn's case is alluded to; yet much doubt exists in the minds of many surgeons as to the correctness of the diagnosis in this case. Many excellent, and somewhat lengthened, observations are made upon the subject of Aneurism, and particularly upon its treatment; we are glad to find due honour given, as it always ought to be when considering this disease, to John Hunter. Mr. Miller here describes "Aneurism by Anastomosis; Vascular or Erectile Tumour," "the Nævus Maternus," although he says it "might have been classed with tumours," we think it would have been much more correct to have so considered it; there is an Anastomozing Aneurism, in which several arteries shoot into and supply a sac, previously formed upon a vessel by injury of that vessel; a condition frequently confused with the nævus, in consequence of the same termbeing often applied to the two affections.

"Affections of Veins" compose the eleventh Chapter; a subject only of less importance than diseases of the arteries, because their more serious affections are less frequent. They consist of Phlebitis, Varix, and Entrance of Air into the veins. Phlebitis is described as Fibrinous, and as Suppurative, the latter being limited and diffuse. The diffuse Suppurative Phlebitis being almost certainly fatal, the pus poisoning the whole mass of blood, and forming "purulent depôts," most frequently situated in the lungs. The cure for Varix is Palliative or radical; our author appears to prefer the twisted suture, the needle passed under the vein, and the ligature over it. Every mode of positively arresting the circulation through the vein, and every attempt to obliterate or destroy it, is attended with danger: we have derived much success from freely blistering the integument over the distended vein or veins; the effect, though expected to be palliative, has occasionally been radical. "Entrance of Air into veins" is truly an alarming casualty, generally occurring in wounds when a vein of considerable size remains open, or is "canalized."

The twelfth Chapter is occupied by Hæmorrhage, Arterial and Venous, and the Hæmorrhagic Diathesis. The means of arresting bleeding are termed "hæmostatics," which are natural or surgical; the former are most interesting to him who delights in recognising the astonishing resources of Nature. The surgical means, so important in their prompt application, are here arranged under the heads of—1. Pressure, including the use of the Tourniquet; 2. Position; 3. Cold; 4. Styptics; 5. Escharotics, actual and potential; 6. Plugging; 7. Ligature, "the most sure and satisfactory;" Mr. Miller considers the division of the inner coat of the artery to be necessary in successful deligation; a circumstance which admits of considerable doubt; certain is it that the obliteration of the artery will not be prevented thereby, and most probably it will be favoured.

8. Torsion; 9. Nauseants and General Treatment; 10. Syncope. Our author entertains a salutary dread of placing a ligature on a vein, and we concur in the propriety of avoiding such procedure if possible, but we must not risk a greater danger to shun the phlebitus, which most probably will not occur, if the vein be previously healthy; we have seen the ligature applied to the femoral, in consequence of active bleeding after amputation, separate without the slightest inconvenience, even earlier than that from the artery. The Hæmorrhagic diathesis is described as hereditary, with "many points of resemblance to both the scrofulous and the scorbutic," its cause being twofold, a morbid condition of the blood, and also of the capillaries.

Angeio-leucitis, or Inflammation of the Lymphatics, with "Inflammatory Swelling of the Lymphatic Ganglia, and Glandular Tumours," compose the thirteenth chapter. The fourteenth chapter contains very brief observations on Neuritis; and remarks, perhaps too much curtailed, on the all-important subject of Neuralgia; the less to be regretted, in consequence of its connexion with Irritation previously treated of.

The third section of the book, under the heading "Perverted Nutrition," contains in one chapter a dissertation on Tumours. Mr. Miller wisely states, "It is impossible to construct a classification which shall embrace every tumour. We attempt only that which may include the majority: arranging them, also, in a form at once convenient for description, and suitable for enforcement of the practical details of treatment." He then arranges them into "Tumours of the Soft Parts, and Tumours of Bones." The former being of two kinds—*Solid* and *Encysted*. "The solid tumours, again, are *Simple* and *Malignant*. 1. In the former class are the *Simple Sarcoma*, the *Adipose*, the *Fibrous*, the *Cartilaginous*, the *Calcareous*, the *Osseous*, the *Cysto-sarcomo*. 2. There is a tumour locally simple, but accompanied with and dependent on, a constitutional vice: the *Tubercular*. 3. The malignant are, "the *Medullary*, *Carcinoma*, *Melanosis*, and *Fungus Hæmatodes*." These are alluded to separately, and the malignant somewhat in detail. "The tubercular or scrofulous tumour may be regarded as occupying a middle place between the simple and malignant formations." "The constitutional vice is that of scrofula; the peculiar deposit is of tubercle." Mr. Miller distinguishes Fungus Hæmatodes from the Medullary Sarcoma; and certainly the ordinary characters of each are widely different, however frequently the section of either may disclose portions of the tumour very nearly resembling the other. We have some good remarks upon these diseased growths, and upon carcinoma in particular. They are concluded by "some general observations on their removal by the knife." Under "Tumours of particular Textures," are described, those of the Integument; those of the Mucous Membrane, the Polypi, which are—1. The simple Mucous; 2. The Cysto-mucous; 3. The Fibrous; 4. The Medullary. Sometimes, but rarely, the structure is carcinomatous. Then follow tumours of the nerves, Neuromata. "Tumours of Bone," like those of the soft parts, are simple and malignant, analogous and heterologous. "The great majority, if not all, are included in the following classification: Exostosis, Osteoma, Enchondroma, simple; Osteosarcoma, at first simple, but tending to degeneration and malignancy: Osteo-cephaloma, Osteo-carcinoma, malignant; Osteo-aneurism,

troublesome and tending to disaster, sometimes associated with malignant structure; Spina Ventosa, analogous to the encysted tumour of the soft parts." Several of these bony tumours have varieties, as the Exostosis, Enchondroma, &c.

The fourth, and last, section is on Injuries; the first chapter of which, the sixteenth of the book, treats of Wounds, which are Incised, Contused, Lacerated, Punctured, Poisoned, and Gun-shot. Some judicious remarks are made upon the healing and treatment of Incised Wounds. Mr. Miller strongly urges delay in closing the wound till all hæmorrhage has ceased, and the cut-surfaces are glazed by the exudation of the liquor sanguinis the solid part remaining on the wound, the serum trickling away. The cold-water dressing, as proposed by "the old man of Cos," he recommends till the wound is closed, and then the isinglass plaster introduced by Mr. Liston. We would direct the reader's attention to the account of poisoned wounds, including Bites of Serpents, and Hydrophobia. The average who fall victims to hydrophobia of the number of people bitten by the same rabid animal, is supposed to be one in twenty; a very hopeful assurance for the unfortunate; recovery from the disease, rarely, or perhaps never happening: the average period of incubation "may be said to range between five and ten weeks." Without contradicting this supposition, we would state that we have had undoubted evidence of the virus lying dormant for a year, and in one instance even more. The human subject is also sometimes inoculated with the poison of glanders or farcy, Equinia; as well as with the "Malignant Pustule or Vesicle," "from animals affected with typhoid disease." The chapter concludes with a description of Tetanus, "the morbid appearances of which, found after death, are similar to those in hydrophobia." "The spinal cord usually evinces manifest congestion, both in itself and in its membranes; more especially at the origins of the nerves: with the serum preternaturally and considerably increased." Is this condition really USUAL? Does it not more frequently happen that the spinal cord, and indeed all the other organs, present morbid appearances which can be more readily accounted for as the consequences, rather than as the cause, of this formidable and hitherto mysterious malady?

Burns and Scalds compose the seventeenth chapter. Our author describes six degrees in which the injured part may be affected by the all-powerful agency of heat. The treatment of these extensive injuries, often so empirically conducted, is very simply and sensibly laid down upon the ordinary surgical regulations.

Chapter eighteenth, Effects of Cold, Frost-bite, and Chilblain.

In the nineteenth chapter, Fractures of the Bones are discussed, with their kinds and characters; their predispositions and symptoms; prognosis and mode of union; their treatment, including reduction and retention; in which our author does not give that unqualified assent to the gum and starch bandages for which many surgeons now contend; our experience, however, of their usefulness, leads us to anticipate their almost general use; lastly, we have the important treatment of a false joint from an ununited or a disunited fracture. Dislocation follows in the twentieth chapter, with its causes, symptoms, consequences, and treatment. The

two concluding chapters treat very briefly of "Sprain, and Rupture of Muscle and Tendon; and of Bruise."

We trust that the epitomè we have thus given of Mr. Miller's production will justify our commencing observation, that a reference to its pages entirely removed any feeling of its unnecessariness, induced by its title. We have much pleasure in recommending the work to all members of our profession, whether they be yet students of our art, or actively engaged in administering the inestimable benefits of medicine; whether devoted to an exclusive branch, or to general practice, much instruction and assistance will be gained from its perusal, and frequent reference to its pages. The manner is unfortunately not always an exception from that which generally stains medical writings; a looseness and indistinctness of language often prevails, with occasionally a spirit of dictation which, however it may be excused in the lecture-room, is better avoided in a publication.

I. RECHERCHES ET OBSERVATIONS SUR LES CAUSES DES MALADIES SCROFULEUSES. Par *J. G. A. Lugol*, Medecin de l'Hôpital St. Louis, &c. &c. Octavo, pp. 372. Paris, 1844. Fortin et Masson.

II. RESEARCHES AND OBSERVATIONS ON THE CAUSES OF SCROFULOUS DISEASES. By *J. G. Lugol.* Translated from the French, with an Introduction, and an Essay on the Treatment of the principal Varieties of Scrofula, by *W. Harcourt Ranking*, M. D., Physician to the Suffolk General Hospital. Octavo, pp. 306. London, 1844. Churchill.

III. SCROFULA; ITS NATURE, CAUSES, AND TREATMENT, AND ON THE PREVENTION AND ERADICATION OF THE STRUMOUS DIATHESIS. By *W. Tyler Smith*, M.B. Octavo, pp. 172. London, 1844. Churchill.

THE grand aim and leading object of this new work of M. Lugol are to prove that Scrofula is a disease essentially hereditary in its origin; and that, unless there be a congenital tendency to it in the system, external causes will very rarely, if ever, induce its development in an individual; although they may not unfrequently do so in his offspring. The motto affixed to the title page—*la santé des enfans tire son origine de la santé des parents*—may be considered as the text on which the author discourses with great volubility and earnestness through upwards of 300 pages. Like all very ardent inquirers, he may be inclined to push particular views a little too far; but, in the main, he is unquestionably right; and his elaborate and extensive researches are calculated, we think, to elucidate a very important point of pathological research.

Scrofulous disease manifests its baneful effects from the very earliest months of intra-uterine life. A vast number of cases of Abortion are attributable to its influence on the system, either of the mother or of her

offspring. After birth, it arrests the moral, as well as the physical development of the child, impressing its stamp upon every disease to which it is subject, and vitiating more or less profoundly all the successive evolutions of infancy and youth. At a more advanced period of life, it reveals its existence by a great multitude of morbid conditions and phenomena—the common origin of which has been too generally overlooked by medical men, and which, accordingly, some of our most esteemed authors have very erroneously described as particular and individual maladies.

No part of the body is exempt from the invasion of scrofulous disease; although certain parts or tissues usually suffer much more than others. In not a few cases, the mucous membranes are chiefly affected: hence the Ophthalmias, Coryzas, Leucorrhœas, mucous Fevers, intestinal Worms, &c., that are so frequently met with in practice. If the skin be the principal seat of the disease, we find that there is an unusual liability to Chilblains, various sorts of Eczematous and Impetiginous eruptions, and obstinate ulcerations; also to *pedicular* maladies, "which,"—says M. Lugol—"like the verminous affections of the bowels, continue to be re-produced until the constitution of the patient be regenerated."

When the cellular tissue is most affected, then we have the formation of abscesses in various parts; when the bones are so, Caries, Necrosis, and Rachitis are most frequently the consequences.

Now, however much these various maladies may differ from each other in their outward appearances, we should bear in mind that they are all the offspring of one common morbid state,—the difference being only in their *seat*, or, in other words, in the tissue affected. Hence it is that we often see more than one form of the disease developed simultaneously in the same individual; while, in other patients, there is a renewed succession of different forms, following, and perhaps alternating with each other.

Properly speaking, says our author, there is no Scrofula of any single tissue or organ. In all cases, it is the same disease, which in one patient indeed may affect the skin or mucous membranes, and in another the bones, &c.—but without ever fixing itself upon any of them in an isolated manner. The invasion of any one organ is sufficient in itself to make us dread the development of the evil in some other part of the body. In the same manner, as we shall afterwards find, whenever the disease manifests itself in one member of a family, there is, in that circumstance alone, a strong presumption that it will appear in some, if not in all, of the other children.

If it be asked, What is Scrofula, and wherein does it consist?—we must frankly acknowledge that we cannot answer the question when so put. All that we are prepared to affirm is, that this *vice*, or morbid state, is congenital, and is always manifested by the development of tubercles. This production or deposit is in truth the disease itself, its anatomical and pathognomonic sign, that which characterizes it, and which gives value to all the other symptoms. In other words, whenever a patient is affected with tubercles—no matter where they are situated—he is, in our opinion, scrofulous. Whether he is affected with an ophthalmia, a cold abscess, a caries of the bones, a white-swelling, &c., the nature of these diseases cannot, and ought not to, be questioned: they are all scrofulous, if there have been tubercles, or if there is a coincidence of these morbid productions, either in the patient himself, or in some member of his family.

A Tubercle may be regarded, says M. Lugol, as having the same origin and mode of formation as any of the ordinary organs of an animal body. It is itself a sort of organ, possessed of its peculiar life or mode of existence, just as the Liver or Spleen have theirs; like them, it undergoes a spontaneous evolution. It is a morbid production that sensibly modifies all the organic elements, and deeply affects their functions; and which stamps every person, in whom it exists, with a peculiar complexion, and physiognomy—characteristic of the tuberculous disposition. It is with this peculiar complexion or constitution that the immense number of diseases, improperly termed scrofulous, is associated.

The particular nature and seat of scrofulous affections vary a good deal, according to the age of the individual: the same person is differently affected at different periods of life. In infancy and childhood, the most common forms are chilblains, intestinal worms, the production of lice, ophthalmia, and bronchitis. At, and about, the period of puberty, the signs of tuberculous disease of the lungs—with or without the preceding maladies—usually make their appearance; and at a more advanced age, the formation of cold abscesses, white-swellings, &c., are the usual manifestations of the existing Cachexy. In short, the medical history of a single scrofulous patient will often suffice to exhibit a complete nosological tableau of the disease.

As to the primary causes of Scrofula, it would seem that whatever has the effect of enfeebling the energy of the solids, and depraving the quality of the fluids, is liable to induce its development—if not immediately, at least in the next generation. Scrofulous maladies are essentially the diseases of civilization, or, more properly speaking, of the artificial mode of life that usually accompanies it.

> "They are extremely rare" (we quote from Dr. Smith) "among savage races, except when these are brought into contact with the vices of civilized life, or transplanted into an ungenial climate. With all civilized nations, on the contrary, they are well known to prevail to an immense extent, and in none perhaps more than our own. Tuberculous disorders affect too, all the domestic animals which man has reclaimed from the savage state, and they are common among the species brought from tropical climates to our own country. Climate appears, in the first instance, to have given rise to the peculiarity of constitution most favourable to scrofula; and the wants and vices incident to civilized life, seem to be the agents which have produced the disease in the soil already fitted for its reception." 3.

In a subsequent part of his work, the same writer very justly remarks:

> "The lower order of townsfolk, and indeed the upper also, though from other causes, are continually falling into a state of disorder, termed by Dr. James Johnson the *wear and tear* malady, out of which scrofula is prone to take its rise in predisposed constitutions. Large numbers live in the great towns, in cellars and underground. They present a blanched and etiolated appearance. As a class, such people are very poor, and live badly; so that here we have large masses subjected to precisely the same physical conditions,—living on scanty and unwholesome food, and deprived of light,—as those by which pathologists have been able to produce tubercular disease at will, and to any extent, in the lower animals." 37.

In a vast number of cases, we cannot trace the development of scrofu-

lous disease to any distinct cause, save and except that of hereditary transmission. Whatever, indeed, as we have already said, enfeebles the powers of the system, seems to promote and accelerate its formation; but it is very doubtful whether any external cause is sufficient in itself to induce its occurrence, if there be no family predisposition to the diathesis in some one form or another. Hitherto, medical men have not examined with due attention the laws of hereditary transmission in reference to this too frequent disease; they have generally confined themselves merely to the ascertaining of the bare fact, whether one of the parents of any patient may have exhibited decided marks of the Scrofulous cachexy, or not. The question we shall find, as we proceed, to be one of much more extensive application, and one which requires a much greater extent of research than has usually been given to it.

M. Lugol, on more than one occasion, alludes to the not unfrequent *seeming* exemption of one or two members of a scrofulous family from the hereditary taint, and shows how very generally, even in them, the inborn evil makes its appearance at some time of life or another. The family resemblance, which may hitherto have never been perceptible, at length—perhaps upon some accidental occurrence—becomes too obvious not to be at once recognised. Our author quotes the following case in illustration. A lady, having all the appearance of sound and healthy constitution, was the mother of several children who were decidedly scrofulous. She was much surprised at this, although one of her own sisters was in the very same condition, and another had been affected with rickets. No person could have perceived any resemblance between her and her two sisters, until they had reached *l'age de retour*. "The first time that I remarked it," says our author, "was on seeing them all in tears upon the death of one of the children. They wept in the same manner; they had exactly the same tone of voice, the same accentuation of their words; there was in all of them the same peculiar movement of the commissures of the lips, arising in part from the loss of the very same teeth; their features also were drawn down in the same manner; and altogether the external signs of relationship were most apparent."

We cannot wonder at this; all the children of a family *must* necessarily partake of essentially the same sort of constitution, however much the outward features of this may vary, in consequence of a variety of modifying circumstances on the part, alike of the parents and of their offspring. M. Lugol strenuously insists upon the truth of this position, and adduces a vast number of observations in support of it. It is the pervading principle of his whole work.

Whenever, says he, one member of a family is affected with distinct scrofulous disease, we may be sure that traces of the same malady, or at least of the diathesis which has given rise to it, will be found in the other members. There is a something in the complexion of them all that indicates a similarity of constitution. How often do we see, in the case of scrofulous children, that the skin is soft, flabby, and white; that the head is disproportionately large; that its openings are unusually wide; that the trunk and the extremities are unequally developed—the former being large and tumid, and the latter being comparatively small, the joints only excepted! In not a few instances, we observe that the median line is not

in the middle of the trunk. The result of this deformity is, there seems as if there had been a faulty junction of the two lateral halves of the body; one being placed somewhat higher and more anterior than the other. This formation of the frame, arising from an inequality of evolution, M. Lugol regards as a sufficient ground for an unfavourable prognosis in disease in general. Besides the corporeal defect now mentioned, we may state that most cases of congenital malformations—such as hare-lip, pigeon-chest, fissure of the *linea alba*, non-descent of the testicle, &c.—occur in scrofulous children.

Scrofulous persons are generally of small stature; occasionally, however, they are of unusual and even inordinate size. Both extremes may be attributed to the circumstance, that the vital powers have been deficient in that degree of energy that is required to regulate the development of the organs: hence it is that either a partial arrest, or a hypertrophic enlargement, of the body, is apt to follow.

According to M. Lugol's observation, the majority of scrofulous patients (in France) have dark or even black hair: the proportion of those with light hair is but small. A similar remark applies to the colour of the eyes and the hue of the skin: the latter is much more frequently darkish than fair. He acknowledges that his observations on these particulars are at variance with the statements of many writers; but he appeals to the wards of St. Louis hospital in confirmation of them. The evolution of the teeth, especially those of the second dentition, is almost always tardy in such habits; and the teeth themselves are weak, friable, and apt to be discoloured. The spongy ends of the bones are large, compared with their shafts or compact centres, and also with the adjacent soft tissues,

The evolution of the generative organs is usually more tardy in scrofulous than in other children. In scrofulous youths of 16 or 17 years of age, it is not at all uncommon to find that one of the testicles has not descended into the scrotum. In girls, the catamenial function is often very irregular in its establishment; the secretion being generally either scanty or excessive, and usually accompanied with much suffering and general disturbance. The regular development of the Mammæ and Ovaria is apt to be tardy in such cases. Considering these things, we must at once perceive the importance of scrofulous youths of both sexes avoiding the premature or inordinate indulgence in sexual pleasures. One of the most certain means of fortifying their health consists in keeping all venereal passions in check, until the body has acquired its full and mature development.

The functions of the digestive organs, too, are very generally irregular and deranged in some way or another. Very often there is a deficient appetite, owing doubtless to an atony or *inertia* of the stomach—which, our author considers to be dependent upon "un etat catarrhal de meme nature que l'ophthalmie, le coryza, l'otite, les bronchites, les leucorrhées, &c." Occasionally, however, the appetite is voracious; but, even then, the food does not afford the nourishment to the system that might be expected. The alvine evacuations are seldom quite healthy. In many cases there seems to be a sort of *intestinal leucorrhœa*, giving rise to an obstinately relaxed state of the bowels: portions of the food are then very usually voided, unchanged, along with the fæces.

The skin is often very dry and liable to lichenous and impetiginous eruptions. There is a general defect of transpiration, except in the feet, hands, and arm-pits: the sweat from these parts has not unfrequently an acid and offensive smell.

Scrofulous children are often observed to be unusually apathetic, and unwilling to exert either mind or body. On too many occasions, this inaction is attributed by parents, and even medical men, to a wrong cause. The child is considered wilful and obstinate; and its want of energy is ascribed to indolence, whereas it is the result of *malaise*, if not of actual disease.

"How often," says M. Lugol very justly, "do mothers complain that their children—the daughters especially—carry themselves badly; that they let their head fall forwards, as if they could not keep it up; and that they are always lounging about or sitting down, and seem to be indifferent to what is going on about them. The girls cannot help it. They hold themselves up badly because they are not strong, because the spinal muscles are more or less atrophied; and because the muscular fibre, in general, is deficient in the requisite tonicity. To these causes we may add the defect of harmony in the different pieces of the skeleton: this is usually only the rudimentary condition of far more conspicuous deformities, that are apt to occur at the approach of puberty—sometimes before this period, rarely after it."

That our author, indeed, is apt to carry some of his notions a little too far will appear, we should think, from the following extract.

"In general," says he, "scrofulous persons cannot bear well, either bodily fatigue or mental disquietude. Sometimes indeed they possess no ordinary powers of intellect; but even then there is seldom any application or sequence in their ideas. They experience no sustained vivacity, either of their physical appetites, intellectual faculties, or moral feelings; there is nothing normal, nothing strong, nothing durable about them. All the phases of their existence abort; they have neither puberty nor mature virility; their corporeal and mental development remains incomplete."

There is a good deal of vague assertion here, that is any thing but confirmed by experience. Never was there a more scrofulous habit than that of Samuel Johnson; and who will presume to say that his mind was incompletely developed?

M. Lugol devotes a separate chapter of his work to prove the close alliance, nay, the absolute identity, of Scrofulous and Tubercular diseases. Too many medical men are still inclined to regard phthisis as a mere local malady of the chest at first, and therefore to direct their treatment rather to the relief of the pulmonic symptoms than of the constitutional diathesis. *Sydenham* very emphatically announced his view of the question when he designated phthisis by the name of "Scrofula of the Lungs"—the expression of a doctrine, says our author, of which I have acquired the anatomical proof, as I shall speedily make known in another work on Tubercles, which is already in the press. *Portal*, also, was decidedly of opinion that phthisis was truly a scrofulous disease. *Bayle* and *Laennec's* sentiments on this subject are certainly not so near the truth as those of their predecessors. The following remarks by our author deserve notice.

"The resemblance between Scrofula and Tuberculous disease is too constant and too obvious to have completely escaped the observation of these distinguished

writers; but it is to be regretted that, on this point of doctrine, they should have been less enlightened and advanced in their views than *Portal*. Their silence as to the scrofulous nature of pulmonary tubercles has been very unfortunate, seeing that it has tended to foster inaccurate ideas of localization, and thereby to encourage a system of treatment, the most dangerous that can be employed in cases of pulmonary tubercles. If these writers, who deservedly enjoy such high authority, had laboured to unmask more completely the scrofulous character of tubercles, and had they pointed out how the course of the morbid action is always accelerated by the adoption of the antiphlogistic regimen—a practice that is based upon and derived from the *alleged* inflammatory origin of tubercles—they would have contributed not a little to prevent the abuse that has been made of blood-letting in a disease which does not, generally speaking, require any depletory measures."

In a vast number of scrofulous patients, who arrive at the age of puberty, phthisical symptoms supervene sooner or later after that period of life. How often have we occasion to observe some form or another of Scrofula, such as Ophthalmia, Ozœna, intestinal Worms, Hydrocephalus, Tabes, &c. in the offspring of phthisical persons! Most scrofulous patients are ultimately carried off by tubercular disease of the lungs: and even, when they die of other diseases or from accidents, their lungs are generally found to be more or less tuberculated. We need not remind our readers that there are various stages, as well as degrees, of tubercular deposit,—from a few dispersed miliary points of a gray-coloured gelatinous substance, to the complete infiltration of one or more lobes of the lungs with the semi-organized matter.

So generally, continues M. Lugol, has Scrofula a tuberculous origin that, in two wards containing in all 84 beds, I ascertained, beyond doubt, that pulmonary Phthisis had existed in more than one half of the parents of my patients. And, indeed, even this ratio is considerably below the mark: the proportion of cases, where the hereditary origin of Scrofula is tubercular, being unquestionably higher. We may therefore with confidence assert—and the assertion is one that has many practical bearings—that almost all the children of those, who die of tubercular Phthisis, will sooner or later exhibit marks of scrofulous disease, if not of the same pulmonary disease, which proved fatal to their parents. Ought not this intimate affinity between Scrofulous and genuinely Tuberculous disease to lead medical men to adopt similar remedies in both morbid conditions, much more uniformly than they are in the habit of doing?

One of the most important Chapters of M. Lugol's work is that entitled, "Of the acquired health of parents who engender Scrofulous children." As the epithet *acquired* is here used in opposition to that of *hereditary*, the drift of his remarks is to point out those extraneous influences or conditions which are liable to occasion the development of Scrofula in a constitution that was originally free from any taint of this Cachexy.

I. The first of these that we shall mention, is the existence of Syphilitic Disease in either of the parents. This is unquestionably one of the most frequent occasional causes of Scrofula. Many scrofulous diseases have, it is well known, a striking resemblance with syphilitic maladies. The Ulcers, Ophthalmiæ, Exostoses, Caries, White-swellings, &c. induced by Scrofula are often most perplexingly like to the same diseases arising from a syphilitic cause. This community of the external signs of the two morbid

states is, in some degree at least, attributable to the circumstance that scrofulous diseases have often a syphilitic origin. *Astruc* carried his opinion on this subject so far as to maintain that, whenever Scrofula cannot be traced to hereditary descent, it is attributable to a syphilitic taint; and not a few of the most distinguished physicians of the last century allowed themselves to be so far misled by this assertion, as to adopt the same treatment, viz. the use of preparations of mercury, in both diseases. Such a mistake is of truly serious importance; as it is now very generally admitted by all sound practitioners, that the administration of this mineral for any length of time, is most injurious in genuine Scrofula; whereas it is almost indispensable for the proper cure of Syphilis.

II. The second occasional cause of Congenital Scrofula that we shall specify is the abuse of venereal pleasures on the part of parents. "If the seminal fluid," says our author, "be secreted immediately before its emission; if it only passes through the reservoirs, in which it ought to remain for some time; and if it be expelled before its integrant molecules be blended in an intimate and homogeneous manner, it is still imperfect and immature, deficient in prolific qualities, incapable of engendering a healthy and robust offspring: the embryo is stamped with a primal weakness, in consequence of which all the phases of its development are retarded and rendered incomplete." This state of things is of frequent occurrence, as we might anticipate, among the luxurious classes of society; and is accordingly a frequent cause of scrofulous disease among their children.

III. Very early marriages of either sex, before the system has acquired its full tonicity and power, are apt to be followed by similar consequences. A man should not marry before the twenty-fifth year of his age; all marriages, contracted before this period of life, must be regarded as precocious, and consequently liable to be followed by a feeble progeny. The lower animals do not seek for copulation, before their full growth is attained; and even in the case of the vegetable world, we find that the fruit of a tree's first growth is always scanty in number and of indifferent quality: it is only after it has struck its roots more deeply into the earth, and thereby acquired its mature strength and vigour, that its produce becomes full-flavoured and abundant. On this point, *M. Lugol* makes a remark that is somewhat amusing from its pure nationality. He tells us that, in consequence of too early marriages, and the not unfrequent dissipation of the fathers, "the aristocratic families of most countries are desolated by scrofula, and almost extinguished by the hereditary progress of this disease. This is the case more especially in Spain, Italy, England, and Russia; and very probably among the privileged classes of society in all nations." The omission of the French, and the insertion of the English, noblesse in this category, are more creditable to our author's patriotic feelings than to his knowledge of the truth or to his candour.

The opposite extremes of the social community are, in the point of view we are now considering, very nearly alike. What with premature marriages on the one hand, and an insufficient supply of food and clothing on the other, coupled too frequently at the same time with inordinate bodily fatigue —can we be surprised at the amount of scrofulous disease that is annually engendered among the working classes? The following picture of the condition of the French artisan and agricultural labourer will be read with

more than ordinary interest at the present time, when every thing appertaining to the state of the poor in our own country is engaging so much attention :—

"Most people are much mistaken in their ideas as to the constitution and mode of existence of our agricultural labourers: they are far from being so contented or so robust as is generally imagined. It is all very fine to talk of their vigorous health and comfortable condition; but the experience of the last ten years, that I have lived in the country (for at least six out of every twelve months), has quite satisfied me that our country population, on the whole, is not of a sound growth, (d'une belle venue), and that most of the inhabitants *age* prematurely. Their food, clothing, dwellings, and general condition, are altogether very unsatisfactory. While the amount of food which they have, is too little by one-third at least, their amount of labour is certainly a third beyond the average strength of a human being. This disproportion between the amount of labour and supply of food is, we regret to say, common alike to our country population and the artisans in our manufacturing cities. The children, also, are set far too soon to work, and are kept too long at it. Besides being imperfectly fed, their moral education is quite neglected. Under the influence of this brutalizing system of bodily privation and fatigue, the evil effects of which are too often aggravated by vicious indulgences, it is utterly impossible that these children should grow up to a healthy and robust maturity."

Compare these remarks of *M. Lugol* with the following passage from Dr. Smith's work :—

"In many country districts, where, as regards fresh air and locality, there are all the natural *agremens* of health, scrofula is nevertheless excessively prevalent, and without doubt chiefly on account of an improper or deficient supply of food. There are but too many parishes in England in which the poor population seldom have in their houses any other animal food than salted pork or bacon, and are thus living on a description of food most likely in our climate to debase their physical condition, and produce scrofula, and other diseases which take their rise in the scrofulous constitution.

"Scrofula is fearfully prevalent among the inmates of the present union workhouses. I look upon the New Poor-law as little better than a vast scheme for scrofulizing the whole pauper population of Great Britain. Under the poor-law rule, able-bodied paupers, as they are somewhat wrongly termed, are forced to work hard, and the amount of their food is so inadequate to supply the waste of the system, and maintain the expenditure of muscular power, that the constitution inevitably becomes bankrupt in health and strength. These are the beings, who are becoming the parents of a pauper race of children, who in their turn can scarcely hope to reach the original standard of English organization. The evils of the poor-law dietaries are thus reflected back upon the face of society, and they will in the end work out their own punishment by giving us an inferior race of peasants, soldiers, and artisans. This is an aspect which the matter must, if it continues, ultimately assume ; and it seems very questionable, whether it is not a pocket wisdom, and a national foolishness, to curtail the rates by poor dietaries at such a risk of physical degeneration on a scale so immense."*

* Dr. Smith asserts that it is well known that scrofula has long prevailed among the boys of Christ's Hospital. He attributes the evil to the faulty character of the diet that is adopted in that institution; the food, he says, not being sufficiently varied, and the use of fresh vegetable food being almost entirely excluded. We have good reason to believe that these statements are

IV. When one or both parents are considerably advanced in life, before they have children, it is not unfrequent that the offspring manifests very decided signs of scrofulous cachexy. It is a well-known and popular remark, that old men's children are generally puny and ailing; there is much truth in the observation.

The decrease in the energy of the reproductive powers in the male may be dated from the forty-fifth year of life, or thereabouts. Not very decided at first, it becomes more and more so as years advance; just as the shortening of the days is the more conspicuous, in proportion as we recede from the summer solstice. The first child or two of a quinquagenarian may perhaps be vigorous and robust; but, if the number of his family increases, the younger children are usually much more feeble. "From the ...y-second year," says our admonitory author, "a man is no longer in the physiological condition that is necessary to procreate a being, whose first ...ain is to grow and enlarge, and whose most rapid growth should occur immediately after conception. At this period of life, a prudent man will ... rather abstain from marriage, seeing that, if he has children, he cannot reasonably hope to see them attain maturity, and he must therefore leave them at a tender age without a father to direct their steps."

The same remarks are, in M. Lugol's opinion, applicable to the female sex. When a woman approaches the critical age, her fecundity, which must soon cease altogether, is already much enfeebled; and the child or children, which she may happen to bear, are seldom endowed with the ...ms of a robust and vigorous life. A woman, if she conceives for the ...t time after her fortieth year, rarely carries the child to the full period; ...d if it does survive to be reared, in most instances, alas! it early exhibits ...e of the characters of scrofula.

There are facts of another sort, which serve to show that the circumstance of the age of parents may have much to do with the development of ...s disease in their offspring. If a couple, after having lived together childless for a multitude of years, are at length blessed with an heir, how often does the child come into the world with the stamp of a congenital weakness!—that is too often the beginning of some scrofulous disease to which it falls a victim in the first or second year of its age! If, again, a long interval of time has elapsed between the births of the ultimate and penultimate children of a family, the former is not unfrequently observed to be much more puny and ailing than the rest.

V. An essential condition of a robust progeny is, that the father be a few years older than the mother. "I have seen," says M. Lugol, "many cases of Scrofula in which I have not been able to discover any other cause, save the disproportionate age of the parents, the father being younger than the mother. . . . . This cause is, however, common enough to have enabled me on many occasions to recognise its operation with facility."

...ceedingly inaccurate: they should therefore not have been made without due inquiry. A copy of the dietary now lies before us; but it is unnecessary to specify particulars. We are moreover informed that very few of the boys are affected with any form of scrofulous disease.

Should there be any hereditary taint existing at the same time, the disparity in question will tend to aggravate the mischief.

Here it may be remarked that the vigour of the offspring seems on the whole to depend more on the health of the father than on that of the mother. Breeders of cattle certainly attach more importance to the qualities of the male than to those of the female parent. Moreover, we not unfrequently see a delicate woman give birth to fine healthy children, if the father be robust: the reverse of this position is of much less frequent occurrence.*

Besides the sexual circumstances which we have now enumerated as bearing upon the question of the origination of Scrofula in a family, it is more than probable that the offspring of persons, who have, at any period of their lives, been affected with Palsy, Epilepsy, Insanity, or Scirrhus, are more than usually apt to exhibit some traces of the cachexy, although there be no hereditary taint in the family.

The obvious inference to be drawn from all the preceding observations is clearly this: that whatever serves to reduce and exhaust the physical energies of the body, more especially those of the reproductive organs, must tend to promote the development of Scrofulous disease in the offspring. If such be a law of Generation, we cannot wonder at the enormous amount of the evil throughout every nation of Europe, and above all in every large manufacturing city. The luxury and dissipation of the nobility and wealthy gentry; the ceaseless application to business, with its numerous carking toils and cares, of the professional man and the trader; and the exhausting labour and stinted food of the lower classes—all work to the same pernicious end, viz. the increase of scrofulous disease among the rising generation.

The condition of the women among the lower classes is even more unfavourable than that of the men. The never-ceasing toils and anxieties leave them scarcely "aucun loisir pour la vie de reproduction." Take, for example, the too frequent case of the wives of petty tradesmen among us (the French). They live from day to day in a small confined and unwholesome shop. The air is rendered still more impure by the vapour of the little *chaufferette*, that is so commonly used to warm them against the chilly damp of their habitation. Can we wonder that these poor creatures generally suffer from a variety of ailments, not a few of which are dependent upon a relaxed state of the generative organs? How then should we expect that a woman in such a condition as this can be the mother of a healthy offspring!

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* M. Lugol asserts that there has been an immense extension of Scrofulous disease throughout France during the present century, in consequence of the excessive drain and destruction of the most robust part of her male population, by the sanguinary wars of the Republic and the Empire. The population of the country has therefore, in a great measure, been renewed "par les hommes les moins propres à engendrer des enfans sains et vigoureux." Under the Restoration, the government found considerable difficulty in forming a corps of 2,500 picked men out of a levy of 80,000 soldiers; and it was even judged necessary, in order to complete this light contingent, to lower the standard height, which had originally been fixed at one *metre* and 70 *centimetres*.

the thing is utterly impossible. Worn out with the fatigues of the day, she is quite indifferent at night to the endearments of conjugal life; and, if she does conceive, her system is not vigorous enough to give due nourishment to the child within her.

Our author recurs to this subject in a subsequent part of his volume, and draws a woful picture of the state of most scrofulous women after marriage. Instead of becoming thereby more healthy, as they are often very erroneously led to anticipate, the constitutional taint generally becomes more active and exasperated, and a host of new troubles is induced. Very many of them remain sterile; or, if they conceive, suffer abortions and premature deliveries. When they go their full time, they usually suffer much more during labour than other women. Leucorrhœa is moreover distressingly common in scrofulous females. Besides their physical maladies, these poor creatures are often the victims of the most painful disquietudes of mind. Hence the frequency of those *malheurs et chagrins domestiques*, that mar the peace of married life. "Too often," continues M. Lugol, "Marriage is unadvisedly recommended with a view of invigorating the health of young women. This is a sort of flattery, to which a medical man should never yield his concurrence. On the contrary, it is his mission, and his duty, to resist the vanity of parents, and to show them how it they are to sacrifice to this feeling the future happiness of their children." As a matter of course he gives a case in point, where a young mother of six children—two of whom had already died—gave vent to the most bitter reproaches against *les sommités medicales qui avaient donné à ses parens le conseil de la marier!* How often, he adds, do we hear the remark that health is the first of blessings; and yet how little is the regard that is paid to secure this foremost good! It would actually seem as if less anxiety were felt, in the present day, about the health of our own offspring, than about that of our domestic animals; for certainly more trouble and pains are taken in selecting a stallion, than a *chef de famille!*

The frequency of Abortion in women of a scrofulous constitution has been alluded to more than once in the preceding pages. Our author goes so far as to assert that one-fourth at least of scrofulous children perish within the womb. According to his views, the cause of Spontaneous Abortion may reside in the state of health either of the father or of the mother.

When the seminal fluid of a man is too degenerate and not duly vivifying in its qualities, its elements cannot blend sufficiently intimately with the elements derived from the female system, to possess a common and consentaneous existence and pass through all the phases of fœtal life. Under such circumstances, Abortion will take place, however healthy the mother may be; just in the same manner as deteriorated grains will not germinate healthfully, even in the very richest soil. I knew, says M. Lugol, a scrofulous man, whose puberty was not mature till he was nearly 30 years of age, and who married two or three years afterwards. His wife, who appeared to be in excellent sound health, had repeated miscarriages, and never carried a child to the full term. Now what Scrofula did in this case—and it is far from being an uncommon one—may be owing to debauched habits in another, and to advanced years on the part of the husband in a third.

Cæteris paribus, the principal cause of Abortion is the degradation of the generative organs in the male: more rarely it resides in an analogous con-

dition of these parts in the female. Such a condition may be present, and yet the woman, if impregnated by a healthy man, may become the mother of a robust offspring; but we rarely, if ever, observe that a healthy woman has very robust children by a man who is of a feeble and scrofulous constitution.

When the hereditary taint of the fœtus is derived from both parents, miscarriage is of almost inevitable occurrence; and pregnancy therefore becomes a cruel deception. Should the child survive to the full period, it is only born to suffering and an early death.

It is because Abortions have their source in the faulty health of one or of both parents, that they generally occur without any external cause. It is a common, but a very erroneous, opinion that this accident is often owing to slight casualties; such as a slip of the foot, jolting in a carriage, lifting a weight, a sudden fright, the abuse of venereal pleasures, and so forth. If such were the case, few women would escape miscarrying. The truth is, that these things have little or no effect on women of a decidedly healthy and robust constitution. Nay, is it not well known that even the most violent (so-called) abortive medicines seldom succeed in inducing miscarriage? and, alas! many are the cases, wherein the woman has died from the use of such means, but without the expected effect being produced. Indeed, we do not hesitate to assert that criminal attempts to induce miscarriage—except resort be had to mechanical interference—very seldom succeed.

Hitherto even the most esteemed obstetrical writers have paid little or no attention to the influence of internal or constitutional causes in inducing miscarriage. For example, *Desormaux*—certainly one of the best authorities on the subject—does not even so much as allude to them in his various works. This circumstance is, in itself, sufficient to show how little this point of practice is attended to in our schools of medicine, in the present day. The accident is almost always referred to some merely local cause or another; and yet an abortion, thus induced, is (we use M. Lugol's own words) *un fait isolé et sans valeur dans l'avenir.*

So great and so varied are the evils, social as well as personal, that arise from the diffusion of Scrofula among a nation, that our author seriously suggests the propriety of governments retaining to themselves a power to regulate—under certain restrictions, as a matter of course—the marriages of such of their subjects as are unfortunately affected with the malady.

His reasonings on this delicate point of political ethics will be best understood from the following somewhat fanciful observations.

"A man marries *pour posseder une femme et procreer des enfans sainement organisés:* his object is happiness, moral and physical. But this two-fold object is frustrated, if either parent imparts the germ of hereditary disease. The only disqualification for marriage, according to our Civil Code, is insanity; and this merely because there is, then, the want of free assent in one of the two parties. The State has unfortunately not reserved to itself any power to inquire into the condition of those who marry. I admit that many difficulties stand in the way of any direct interference of the government in this respect; but surely there is no good reason why society should be left unprotected against the propagation of hereditary diseases."

M. Lugol even regards with a tolerant eye the practice of the old Spartans, who, it is well known, put their puny infants to death; but he afterwards guards himself from misconstruction, by saying that it would be much better to interdict marriage, where there is reason to believe that the offspring will inherit a tainted constitution. "It will at once," continues he, "be objected that we have no right to interfere with the personal enjoyments of any one. But such language is only flattering for a moment to vanity, at the expense of health and comfort. How often do we see discord and disunion in a family, caused entirely by the circumstance we are now alluding to! I have myself known the existence of a simple Otorrhœa embroil the peace of a newly-married couple; I have known insanity and suicide induced by the dislike thereby occasioned; and too often have I seen young women, thus situated, take refuge in consolations, which have afterwards plunged them, during the rest of their lives, into unavailing remorse!"

After narrating a case in the way of illustration, he exclaims: "What a deplorable existence for a woman! either to have constantly-recurring abortions, or to give birth to children that are inevitably sickly and feeble from the first moment of their existence." His anticipations of the blessings, that would flow from a code of Legislation *empreinte de l'esprit physiologique*, may be gathered from the following prediction: "When this (the interdiction of marriage among certain parties) shall be inscribed in our codes, and when all the world shall be born under the same law, society will soon be peopled with men of a better complexion, and the number of hereditary diseases will gradually become less and less; so that, in the course of three or four generations, they will be of rare occurrence. Moreover, there will be fewer persons who are blind, dumb, deaf, or rickety; there will be fewer orphans, incurable invalids, and infirm old men; the population of our *hospices* will rapidly decrease; and there will be a larger number of healthy robust citizens for the agricultural and manufacturing interests."

How far the strong arm of the law can ever be made available to the interdiction of marriage, in a country that professes to have freedom of thought and action, we must leave to M. Lugol's countrymen to determine. Any attempt to do so would be regarded, we are sure, as at once impious and tyrannical in the extreme, in most nations. Some persons however are, we are assured by our zealous author, very docile and accessible to reason on this point of duty, as to marrying whom and when they please, and will cheerfully be guided by the instructions of their medical attendant. As a matter of course, he gives us a case in proof. "A man, thirty years of age, and who had suffered much from scrofula at a former period of his life, consulted me before he took the serious step of marriage. In giving him permission, if I may say so, I strongly advised him to spend nine months at least of the year in the country; to be a great deal out in the open air; and every now and then to travel about for change of air; to live on a nourishing and generous diet; to avoid all sorts of excesses; to cultivate the sweet affections of home; and altogether to lead a patriarchal life. By following this regimen, he will doubtless enjoy himself as far as is practicable, and *il travaillera sur lui-meme à la regeneration de sa race.*"

Dr. Smith has some very sensible remarks on the Marriages of Scrofulous Persons. Their pith is contained in the following extract:

"To sum up the whole matter: those who possess the signs of the strumous temperament, or have reason to suspect their strumous descent, should beyond all things avoid a matrimonial alliance with a blood relation, or with another party of strumous habit; and they should, with almost equal care, avoid a union with another of the same temperament as themselves, even if there be no signs of the strumous diathesis engrafted on the temperament which resembles their own. The union of opposite, or at all events of different, temperaments, is of all means the most likely to remove the signs of struma in the offspring." 155.

As to the commonly-received opinion, that hereditary *Scrofula sometimes passes over one generation to appear in the next*—as seems to be not unfrequently the case with such diseases as Gout and Asthma—M. Lugol strongly protests against its truth. "This doctrine is altogether gratuitous. A man, who is born of scrofulous parents and has children that are so, is scrofulous himself. The proof of this lies in the very state of his own progeny; otherwise we must suppose that a man may communicate to another what he has not got himself; in other words, that there may be an effect without a cause. * * * * * The facts, on which this opinion has been supposed to rest, are quite fallacious. They are similar in all respects to those which we have alluded to before, on the subject of Scrofula being transmitted by parents who themselves seemed to be quite cured of the disease, or who were supposed not to be at all scrofulous, although they had brothers and sisters who were decidedly so."

In examining the question as to the escape of an intermediate generation from the constitutional taint, many circumstances, which are too often overlooked, require to be taken into account. Not a few persons are unable to tell us, with any degree of certainty, whether they were sickly in early childhood or not; and others will do all in their power to conceal the existence, or even the slightest suspicion, of Scrofula in any member of their family, and to divert the attention of the medical man from pursuing the unwelcome subject. It requires, therefore, no ordinary tact and perseverance to arrive at the truth in many instances. The discriminating eye of an experienced physician will, however, often detect the existence—although latent—of the inborn evil, by some trifling peculiarity of bodily conformation, which would quite escape the ordinary observer. For example, the joints may be disproportionately large, compared with the size of their shafts, or with the plumpness of the soft tissues; or one or two of the cervical glands may be a little enlarged; or there may be a tendency to weakness of the eyes, or to slight discharge from the nose, or to leucorrhœa, &c. The existence of any one of these conditions is sufficient to declare the existence of a strumous habit, however healthy the individual may *seem*, and assert herself, to be.

Dr. Smith, we may remark, differs entirely from M. Lugol in reference to the question we are now considering. He maintains that, "in a highly scrofulous family, the scourge may pass over one generation without affecting it, but only to revisit the next." He admits, indeed, that this *Atavism*, so to speak, of the disease, seems to border on the marvellous; but he fully believes that its truth is completely established, and appeals to his own experience in confirmation of it.

"More frequently," he goes on to say, "it occurs in scrofulous families, that there are some affected in every generation, while others remain pure. The disease, or the tendency to disease, often descends indirectly and irregularly, occurring in uncles and aunts in one generation, and nephews and nieces in the succeeding. I should observe that Sir James Clark believes that the occurrence of scrofula in alternate generations will admit of explanation without supposing that the disease sleeps in one generation to re-appear in the succeeding. I believe this eminent physician considers these cases are explainable by the actual eradication of the disease in the generation in which it is absent, and its re-development when it appears in the following generation, by the agency of new causes. I submit, however, that there are sufficient reasons for the rejection of this latter doctrine. Such a kind of pathological atavism, or irregular development of disease, has always been so frequent, and so much a matter of common observation, as to be very generally believed. And further, we see the same thing happen with regard to physical organization. It frequently occurs that a child resembles one of its grandparents or an uncle or aunt, in growth, stature, temperament, and mental qualities, while it bears little likeness to its immediate progenitors." 13.

The weight of evidence and force of reasoning seem to us to be decidedly opposed to the opinions of the English Author, and in favour of those so strenuously advocated by M. Lugol. We cannot bring a clean thing out of an unclean; and how can the tree, that is corrupt, bring forth good fruit? So it is, most probably, in reference to the transmission of Scrofula—which, be it always remembered, is not so much a disease as an unhealthy constitution or diathesis of the body. We are inclined, therefore, to agree with M. Lugol, that no thoroughly robust and healthy person is ever born of scrofulous parents: *fortes creantur fortibus*. As we have already said, the tendency to the development of the disease in the offspring is greater when the hereditary transmission is derived from the father, than when it is from the mother.

Treatment of Scrofulous Diseases.

It is certainly much rather by following out a judicious hygienic regimen than by the use of any direct medicinal agents, that we can hope to effect a salutary change in the constitution of scrofulous patients. M. Lugol does little more than merely allude, here and there, to the therapeutic part of his subject: his present work does not profess to embrace more than the *etiology* of the disease in question. He takes occasion, however, in more than one passage, to reprobate with marked condemnation the common use of antiphlogistic and other lowering remedies in the maladies of scrofulous children, and the too-prevalent custom of localizing, in practice as well as in theory, the morbid action, without paying due attention to the general condition or diathesis of the system. He strongly enjoins free exposure to light and air in the treatment of most forms of the disease. "I have had frequent opportunities," says he, "of observing the bad effects of treating scrofulous Ophthalmia in dark chambers. It is not an uncommon remark with such patients, that they see better on those days when they are taken to the surgeon for advice." He then proceeds to point out the great importance of regular exercise, in the treatment even of White Swelling of the joints. "In my third memoir on the employment of Iodine, published in 1831, I dwelt at some length on the value

of this mode of cure—viz. regular bodily exercise, (the patient walking, as a matter of course, on crutches,) along with the use, external and internal, of ioduretted preparations. Since that period, I have uniformly acted upon this principle; and the great success, that has attended my hospital practice, has been publicly testified by Professor Magendie and many others. .... Why is my practice not more generally followed? Simply because medical men persist in regarding this, and many other forms of scrofulous disease, as of a local nature, and not as the mere expressions of a constitutional Cachexy."

We must now turn to Dr. Smith, who enters much more largely into the subject of the treatment of Scrofula. We shall select a few mems, that may possibly amuse, as well as instruct, the reader.

He recommends the Solution of Gastric-juice or *Pepsin*—as it has of late years been called—not only as a stomachic remedy, but also as a tonic of great efficacy in many cases. He thinks it likely to come into general use: we much doubt it.

"I have," says he, "been in the habit of giving the solution of pepsin about a quarter of an hour after every solid meal, giving a larger quantity after dinner than at any other time. There can be no doubt that it gives the stomach an additional digestive power; and besides increasing the general strength, I have seen it remove the gastrodynia, flatulence, and heat at the epigastrium, which is so common during digestion in delicate persons." 77.

With respect to *iodine*, Dr. Smith is adverse to the large doses in which it and its preparations are so often administered. He prefers giving them in minute doses, largely diluted, and upon an empty stomach.

"A drachm of the iodide of potassium, dissolved in an ounce of distilled water, and this solution given in doses of twelve or sixteen minims three times a day, in a tumbler of water, will bring the system under the effects of iodine in a few days. The peculiar determination to the mucous membrane of the nose, eyes, and fauces, will be established, the taste of iodine becomes perceptible in the mouth, and the odour of it in the increased mucous secretion. As another instance of the effects of still smaller doses of iodine in the prevention of disease, I may refer to a statement of Boussingault respecting the comparative frequency of goître among the inhabitants of different parts of the Cordilleras in South America. This chemist states that in certain districts, in which the population use salt impregnated with a very small quantity of iodine, the health of the inhabitants is good; while in others, where salt is used entirely destitute of iodine, goîtrous diseases abound. Dr. John Davy, in referring to the above, says:—'It is not improbable that the apparent increase of scrofulous and consumptive disease in recent times may be connected with the over-refinement of salt; that is, carried so far as to deprive it of its iodine principle, which seems intended by provident nature as a corrective of certain injurious causes productive of a terrible class of diseases.'" 91.

But far more efficacious than Iodine, or any other medicinal or hygienic agent, is—can our readers guess?—*the royal touch.*

"It is my intention," says our credulous author, "on the present occasion, to avow a firm belief in its power and efficacy. I cannot agree that a practice followed implicitly for the space of seven centuries in this country alone, besides its long performance in France, and which lived through our golden age of letters, could have been purely fictitious, and not have been demonstrated to be such beyond the power of appeal. Those who saw most of its operation were

the firmest of its supporters, and it frequently obtained the testimony of medical practitioners. Thus, Wiseman, serjeant-surgeon to Charles the First, a good authority in scrofula, as he himself practised in this disease, declared that the king cured more scrofulous patients than all the chirurgeons of London put together." 164.

Without recommending, in so many words, the re-adoption of the royal remedy, Dr. *Smith* wishes us, nevertheless, to believe that "no other mental remedy of equal efficacy was ever devised or practised; and certainly, as I believe, nothing of the kind can be resorted to at the present day which approaches it in power." What says he of the wonderful cures that have been and still are (so, at least, we are told, and that too in print) effected by the mere sight of holy relics, such as pieces of the true cross, bones of saints, the blood of our Saviour, and so forth? Are *they* not quite as authentic as any thing that has ever been recorded of his favourite mental remedy for Scrofula? It was only the other day that we read (in the Athenæum for Oct. 12th) of the marvellous cures that have been performed in the course of the present season, at Treves, by the mere exhibition of the *real* (as a matter of course) Holy tunic to the gaze of the poor ignorant beholders, who flocked in tens and hundreds of thousands to the shrine of the Cathedral of that city. The lame walked, the blind saw, and the dumb spake! Among the rest, the young Countess Jeanne of Munster, who had lost the use of her legs for upwards of three years, no sooner bent before the relic, and touched the sacred cloth, than her limbs were straightened, her figure became once more erect, and she quitted the Cathedral, leaving her crutches behind her in memory of her miraculous cure!! What will Dr. Smith say to this? Might not the display of such a precious piece of sanctity be still more effectual than even the touch of a royal hand? How far the re-institution of the regal prerogative, in the person of our gracious Queen and Governor, might serve to counteract the scrofulizing effects of the much abused new Poor Law, we must leave to Sir Robert Peel, or some other of our learned senators, to determine.

While this article was passing through the press, we received Dr. Ranking's translation of M. Lugol's Treatise. On the whole, it is well and ably executed; and the profession, we believe, will be pleased to have an English version of this somewhat remarkable work. We cannot, however, concur with Dr. Ranking, in his extravagant laudation of his author's researches—"which," he declares to be, "in extent of benefit conferred, and for advancement of rarely useful medical science, unequalled by the labours of any other individual in any other department of medicine." Few medical men will join in such an exaggerated statement, or agree with Dr. R. in many of his therapeutic rules and suggestions—which, as may be anticipated, are all based on the doctrines of the anti-scrofula physician of St. Louis' Hospital. In our opinion, the whole of the appended Essay on the treatment of the disease is vitiated by a most unwise over-estimate of the curative powers of Iodine and its preparations. For example, we are told that "the only system of treatment, which is really deserving of confidence (in scrofulous diseases of the bones and joints), is the internal and external employment of iodine, combined with such mechanical contrivances as shall enable the patient to be continually in the open air;" and Dr. R. assures us that "he has seen more than one patient, whom a

Lumbar Abscess was daily bringing nearer to the grave, gain appetite and flesh, and the discharge cease in less than a month from the time of commencing the medicine." He recommends, also, that scrofulous glandular abscesses should be opened by incision, as soon as fluctuation becomes distinct, and forthwith be injected with a solution of Iodine—a practice that few practical surgeons, we should think, will follow; even though it be followed by M. Lugol himself. In the treatment of Porrigo and the severer forms of Eczema and Impetigo, the internal use of the medicine is deemed almost indispensable; and in strumous Ophthalmia it constitutes, in Dr. Ranking's opinion, our sheet-anchor of hope;—the Quinine, although a most valuable tonic, "having no special effect upon the tubercular constitution, and being therefore unable to prevent the liability to relapse." The Liquor Potassæ is regarded by him as equally defective in this point of view; the preparations of Steel are only incidentally mentioned; and the effects of warm clothing are scarcely so much as alluded to.

The only other topic that we can at present notice is the advice contained in the following passage:

"When, from the known peculiarities of the parents, an infant is suspected to be scrofulous, it should, unless the contamination be clearly confined to the father, be intrusted immediately to a wet-nurse. The mother ought not, in any case, to suckle her child, however well she may be prepared so to do, if she or her family exhibit the scrofulous diathesis." So unqualified a recommendation as this is surely most injudicious; and even were it not so, is it not obvious that it would be nearly impracticable? Where are the wet-nurses to be found for every child of every woman, in whom, or in whose family, there is a scrofulous taint? and what, pray, is to become of the nurses' own poor children deprived of their natural food, and thereby rendered subject to that very disease, which Dr. Ranking seeks, in rather a strange manner, to eradicate? Thank heaven, there is no occasion for the sweeping condemnation of suckling to so large a number of mothers, that is laid down in the paragraph which we have quoted. That scrofulous women should suckle their children *less* than those of a more robust constitution, we readily admit; but that they ought not, in any case, to do so at all, is an injunction that seems to us to be alike injudicious and unrequired.

MEDICAL REFORM.

I. ARTICLE ON MEDICAL REFORM IN QUARTERLY REVIEW. Volume Sixty-seven. 1841.

II. THE TOUCHSTONE OF MEDICAL REFORM. By *Joseph Henry Green.* 1841.

III. A STATEMENT BY THE SOCIETY OF APOTHECARIES. 1844.

IV. A BILL FOR THE BETTER REGULATION OF MEDICAL PRACTICE THROUGHOUT THE UNITED KINGDOM. 1844.

V. AN ADDRESS OF THE SOCIETY OF APOTHECARIES. 1844.

VI. A MANIFESTO BY THE MEDICAL AND SURGICAL ASSOCIATION OF THE BOROUGH OF MARYLEBONE. 1844.

VII. A SPEECH DELIVERED AT DERBY. By *Charles Hastings,* M.D., President of the Council of the Provincial Medical and Surgical Association. 1844.

VIII. A LETTER FROM CHARLES CARTER, ESQ., TO THE NORTH OF ENGLAND MEDICAL ASSOCIATION. 1844.

IX. AN EXPOSITION OF THE LAWS WHICH RELATE TO THE MEDICAL PROFESSION, with an ample Analysis of Sir James Graham's Bill. By *John Davies.* 1844.

X. SIR JAMES GRAHAM'S BILL REPUDIATED. By *John Thomson,* M.D. 1844.

A MOVEMENT in the medical world equal to the present has never been witnessed. It is no partial result of an objectless agitation, but the throe of a large and important body, wounded in its most vital parts. The *vis inertia* of the Profession has been overcome, and men are called out from that tranquillity and retirement which they love, and which in many instances they have well earned; for, it is to be observed, that the present opposition is joined in often times as keenly, although with more discrimination, by several senior practitioners whose prospects it can little affect, but who feel actuated by a laudable *esprit de corps,* as it is by those who have not long entered the Profession, and who believe their future prospects to be seriously menaced by the Bill. It is curious to observe the workings of the human mind throughout the thirty thousand medicos in this mighty empire, while agitating this question! A good many of the high aristocratic order, believing that their own pecuniary interest is but little concerned in the event, look on in apathy, and think little on the subject. Another good sprinkling of the Pures—medical and chirurgical, calculating on indirect gain, join in the cry against the project of the Home Secretary, in hopes of increased popularity. But the great body of GENERAL PRACTITIONERS, alarmed, and not without reason, that their income will be

diminished, are up in arms against the "free-trade" in Physic which our legislators are preparing for us. Thus, self-interest is the grand propelling power, after all, verifying the sentiment of the poet—

"Self-love and social are the same."

The Minister acted prudently and fairly in allowing so long an interval to elapse between the proposition of the measure and any attempt being made to carry it; seeing that, with his power in the house, and the apparent concord of all parties there in its approval, he might have carried it at a short notice, before it could be effectually opposed, or even properly understood, by the profession. The formidable opposition which has been generated during this delay is not, however, one whit stronger than the crisis demands; for the various provisions of the Bill have been framed with far too much connectedness of purpose and deliberation to be withdrawn, or even modified, unless a really imposing power be arrayed against them. Any one who will be at the pains of perusing the two first documents named at the head of this article, (and they are well worthy of a very attentive perusal,) will see shadowed forth in no indistinct manner, more than three years since, not only the principles but the practical provisions of this measure. Suggested then by such influential members of the Profession as are the authors of these tracts, and adopted by the Ministry after so deliberate a consideration, and with so few additions, we may be certain they will be relinquished with difficulty, and at most but partially.

We have much greater faith in the efficacy of the opposition than we had awhile back, inasmuch as it has become more moderated in its tone and more reasonable in its object. At first, the Profession, which had been so long demanding the representative system as the bread of its corporate existence, stood aghast when a stone in the shape of the present bill was offered it, and panic-struck at the deprivation of status and irruption of the unlicensed which seemed imminent, became frighted from its propriety, and determined upon being satisfied with nothing short of the unconditional rejection of so obnoxious a measure. Even now, when sufficient time for mature reflection has elapsed, the power which unanimity would confer is withheld by a section of ultra-opponents, whose numbers, however, we feel convinced must diminish in proportion as inquiry into the capabilities of the measure and wants of the profession progresses. Suppose even the Profession possessed power enough to prevent the introduction of the present bill at all, would it act prudently in putting it into action? We think most decidedly it would not. That a reform in our medical institutions has become essential to their well-being, is either a fact, or is believed to be one, by so preponderating a majority of their members, that tranquillity and harmony can never be expected until it has been achieved. We have seen the utter failure on the part of all those who have hitherto attempted it, in producing a measure either satisfactory to the profession or palatable to the legislature: and if, after such constant urging as he has been plied with, a minister of the administrative talents of Sir James Graham prepares a measure with great care and deliberation, and yet is unable to carry it in even a modified form, in a house where his influence is so great, we shall

be curious to see the member who is sanguine or foolish enough to attempt anything on behalf of so impracticable a matter, for the next twenty years to come, at least. In the mean time we must go on in the same unsettled and unsatisfactory state, patching up this corporation, and fashioning that one, according to the necessities of the moment and the urgency of the demand.

The opposition has not only been injudiciously exclusive, but also somewhat unfairly conducted. Charges have been brought against the framers of the bill of a deliberate design to inflict a deadly blow upon the well-being of the general practitioner, which nothing but an exaggerated and one-sided view of its clauses will justify: and even so pitiful a motive as a desire of revenge, in consequence of the measure of success which attended the medical opposition to the New Poor Law, has been assigned as actuating the minister in the introduction of a measure which is at least of as much importance to the public at large as to the profession. We are not disposed to join our brethren in congratulating themselves upon the possession of the powerful co-operation of the *Times* in the agitation of this question. Our cause ought to be strong enough and just enough to stand upon its own basis, without enlisting party-writing upon its behalf; and it is surely derogatory to the Profession to be made the cat's-paw of any journal, however eminent. The *Times* participated in the general ignorance of the public press as regards medical matters, until the fact of Sir James Graham having come into collision with the profession upon this question, induced it to employ an able pen in the hope of adding still farther to the odium it has so long and so perseveringly sought to attach to all this statesman's acts.

It is not our intention to examine the Bill clause by clause, for its analysis has been so completely and repeatedly undertaken, by both its opponents and advocates, that the Profession ought to be tolerably well acquainted with its various provisions by this time. We will confine our attention to noticing its principal defects and omissions, believing, as we stated in our last, that a few strokes of the pen might render this much abused measure a great benefit to the community, as well as to the profession. Its two plague-spots are the faulty construction of the Council, and the omission of a penalty upon non-registered practitioners; and to the consideration of these points we will first address ourselves.

The *Constitution* of the *Council of Health and Education* is beyond all comparison the most important feature of the measure, and yet the hundreds of petitions and resolutions, which have been drawn up in various parts of the country, contain scarcely any suggestions as to its composition, but are almost exclusively occupied in complaints against quackery. The powers and duties of the Council, as respects the various objects of State Medicine, we are not informed of; but in all matters regarding the profession it will be the supreme and absolutely controlling body, possessed of the most ample powers for the direction of the course of medical education, the sums to be paid for it, the examinations of candidates, the registration of practitioners, and even determining which grades of the profession shall fill certain offices. We do not say that the possession of these powers is not essential to the establishment of a system of uniformity, and

that connexion with Government which is now generally admitted to be the most feasible project for the removal of anomalies, healing differences, and contributing to improvement; but is it not of the last importance that a body invested with such despotic powers should be so constituted as to afford the best chance of their being wielded to the advantage of the public and of the profession? This can only be accomplished by a *representative system*, the public on the one hand and each branch or grade of the profession upon the other, having its voice in the Council. The Bill in fact acknowledges a principle of representation, but carries it out in a most partial and unfair manner. Each University, and each College of Physicians and College of Surgeons in the United Kingdom, furnishes a member of the Council, while the Crown is represented by the Home Secretary, President *ex officio*, and six of his nominees; and in this way are the eighteen places, of which it is proposed it should consist, filled up. But, when it is asked what part the general practitioners, who constitute nineteen-twentieths of the profession, and to regulate whose interests this Council is chiefly formed, are to take in the deliberations of this body, the reply is, none whatever, they are unrepresented there! It may be said that some of the six nominees of the Crown may be selected from this body, and they probably would be so; but it will never do for the great mass of practitioners to depend upon any mere chance of this kind, for, as far as the Bill enacts, these persons need not be members of the profession at all. The general practitioners must not seek to have a voice in the Council as a favour, at the will of the Minister for the time being, but must demand it firmly as an indisputable right. Seven members of the Council are more than the Crown should furnish, for there is some risk, owing to the frequently unavoidable absence of the members connected with the Universities and Colleges, of the Institution degenerating into a mere board of government officials, exerting an undue influence over the profession. Three of these at least should be resigned to the representatives of the General Practitioner, one for each division of the Kingdom.

The construction of this Council, we repeat, is of much more importance than is generally supposed, and the subject should be embraced in every petition to Parliament. If more allusion to this topic be not made in the resolutions at public meetings, it will be supposed by the Home Secretary that little objection to the proposed construction exists, and it may be crammed down the throats of the Profession, before they are aware of the poison they are swallowing.

Penal Clauses.—A very natural feeling of alarm and indignation has been manifested by the profession upon the announcement of the intended abandonment of all attempts at direct penal restriction of unlicensed practitioners; and although, perhaps, the evil effect this would have upon the medical body has been exaggerated, its tendency to injure the public can scarcely be doubted by those who will take the pains to think upon the matter. The absence of any provision of this kind, in the present Bill, although a rather curious reply to the numerous petitions for additional protection which of late years have been presented, is not very surprising, considering that opinions in favour of this free-trade system of physic are held by more than one eminent member of the profession itself. The

Quarterly Reviewer, for example, declares he cannot see the propriety, after having pointed out to the public who are qualified practitioners, of still farther interfering and preventing any one who chooses in preference to consult those that are not so. Moreover, he adds, there are cases, do what you will, you cannot reach.

"When the resources of skill and science fail, the instinct of self-preservation will lead many sufferers to look for other aid; and the honest and well-educated practitioner will always have to contend, not only with the St. John Longs of the day, but with those among his own brethren who do not partake of his anxiety to avoid making promises which cannot be fulfilled. There are, in fact, no more offensive impostors than those who march under the banner of the true faith, and we suppose that even the most sanguine petitioner against quackery will not expect that such as these can be extinguished by an act of Parliament."

This is to argue upon the exceptions of the case, and to leave out of view the real evils to be provided against. Few indeed are foolish enough to believe that Quackery can or ever will be suppressed, or are desirous of entering upon a crusade for its extermination; but this affords about as good a reason for the abandonment of all attempts at confining its ravages within some limits, as the persistence of the crime of thieving, notwithstanding the infliction of imprisonment upon its detection, does for the abolition of that punishment. To the unfortunate being who has exhausted all the appliances of legitimate medical skill, it would indeed be cruel to deny the desperate hope and melancholy satisfaction of seeking aid elsewhere; and, as for the black-sheep of our body, we must be content with affixing the seal of professional disapprobation upon their proceedings. Nay, more, yielding thus much to those who are so desirous of the liberty of the subject in this matter, we may state we feel no anxious desire for a law which would restrain Lord this, Lady that, or any of the well-lined-purse and heated-imagination-tribe from seeking out and consulting the whole herd of empirics simultaneously or in succession. But is it not childish to point to the consolation which a few desperate cases derive from the attentions of those who will promise them all and everything, as long as there is a penny to pay for it, while you neglect the vast numbers whose maladies have become aggravated into danger, or prolonged in their continuance through their having inadvertently fallen into the hands of the uneducated? So, too, because a few foolish persons in the upper classes, having more money than wit, and more indolence of body and mind than either, cannot (and need not, as their position in society furnishes them with the means of detection of impostors if they choose to employ them) be prevented consulting and encouraging charlatanism, is the great mass of the humbler classes of the community, possessed of no means of distinguishing the qualified from the unqualified, and usually crediting a man's pretensions just in proportion to his boldness in asserting them, to be allowed to be preyed upon by pretenders, however ignorant, and the protection denied them which this very Bill specially provides for the Union pauper and the felon? Yes, the honest artisan or independent labourer has not the same chance afforded him in the qualifications of his attendant, during an illness whose duration may decide the prospects of himself and family for life, as has the wretched pauper or convicted thief! To carry crotchets like these into practical operation is no laughing matter.

present regulations are compelled to qualify themselves will be content then with a mere smattering picked up as assistants or shop-boys) to engage in the practice of medicine, is not to be measured alone by the diminution of emoluments which will result, but chiefly by the loss of *caste*, so to speak, it must entail. The regular practitioners, unprotected by the institutions to which they belong, will become more or less confounded in the general estimation with the pretenders, and suffer in consequence of their mal-practices; for the popular idea of the medical and other professions has always been derived rather from the errors and delinquencies of interlopers and disreputable members, than from the actions of the well-disposed and honourable portions of them. Then, again, the removal of restrictions which have been once imposed, is a tacit admission of their injustice or inappropriateness, and must contribute to the elevation of persons liberated from their operation in the public estimation.

But, it will be replied, the Bill offers an indirect opposition to the unlicensed practitioner, by refusing to allow him to hold any public appointment, to enrol his name upon the registry, or to sue in a court of law. Little must he know of the real state of the case who believes that persons of this class are usually ambitious of holding public appointments, which would soon reveal their ignorance, that patients will give themselves the trouble, or can often have the opportunity, of searching a voluminous registry, or that the withholding the very questionable privilege of going to law with their patients, will operate in any other way than in preventing them giving them credit. Sir James Graham professes to desire rather to encourage and reward the legitimate practitioner, than to suppress and punish the pretender; but, before he will be able to carry this Good-Boy Principle out, he must have something a little more tempting to offer than Union-doctorships and the like.

The proof of qualification, as stated in the Bill, should be *registration*; but this, to be of any service, must be *compulsory*, without which it is no boon whatever. Any person presuming to practise medicine or surgery without having his place on such registry, should be made liable to fine or imprisonment, upon summary conviction before a magistrate, it being a special duty of the secretary or registrar of the Council of Health to prefer informations of such illegal practices. Public and professional opinion would alike prevent this clause being oppressively worked in the exceptional cases before mentioned. The case of the *chemists and druggists* presents the only obstacle that we know of to the effectual adoption of the above proceeding. Not but that, if this class of persons visited and attended patients, perfectly unqualified as they are for any such duty, there should be the slightest hesitation in putting the penalties in force against them, as indeed none would desire more anxiously than the truly respectable members of their own body. But we believe that proceedings of this kind could not be put into force against what is termed *counter-practice*, the giving incidental medical advice to the purchasers of drugs. And, indeed, we can scarcely see the justice of requiring this on the part of the profession, however useful it might prove, if practicable, to the public, unless registered practitioners also agreed to abandon the practice of selling drugs —a clear invasion of the territory of the druggist, and one which has con-

tributed much to confound the two classes of persons in the eye of the public. We believe there is no hope of such compromise being entered into, and in some respects it is advantageous to the public that it should not be. If the chemist, on the one hand, does some harm by venturing to advise on a subject he does not understand, the open shops of surgeons, on the other, confer a greater benefit upon the humble classes in large towns than many are aware of, numbers of whom, if these were closed, would be driven to have recourse to the unqualified, or to charitable institutions. Young men of good abilities and education, but without a large circle of acquaintances, are often the proprietors of these, and are willing to bestow considerable attention to the cases which fall in their way for a very moderate remuneration, in the hopes that the reputation they acquire may lead, as it so frequently does, to better things. A shop seems a kind of public property into which many a patient will at once walk, who cannot muster up courage to disturb the quietude of the closed private door, be the brass-plate ever so invitingly large.

Let us view the proposed Bill, in the last place, in its relations to the *existing Medical Corporations. Of the College of Physicians* we have nothing to observe. The prospect of repairing their dilapidated finances by a share in the examination fees, will probably act as a sufficient salvo for any loss of dignity the projected superintendence of their arrangements by the Council may seem to inflict.

The governing powers of the *College of Surgeons* have come into an unfortunate, and what we must consider an alarming, collision with the great body of its members, just at the very period when unanimity and confidence are most required. The precipitate grant of, and mode of working out, the new Charter have been followed by the deepest dissatisfaction, which even its abrogation can scarcely allay. The intention of both this document and of the new Bill is evidently the creation of two grades in the profession, and it is not to this intention, but rather to the injudicious manner it has been sought to be carried out, that rational objection can be offered. The requirements of society, and the convenience of candidates, necessitate that admission into the ranks of the profession be obtainable by the *minimum* of qualifications which will ensure respectability of attainments, and capability of future improvement, should opportunities offer. But surely we must not stop here. Those whose pecuniary means or greater talents allow them to pursue a more extended course of study, or to dive deeper into the penetralia of our science, must be encouraged to higher aims, which they can only be, by being assured that their acquirements will be submitted to a more severe test, and that the probability of their eventually obtaining profitable appointments will bear some relation to the pains they have taken to qualify themselves for the adequate fulfilment of their duties. Acknowledging the principle of different grades put forward by the Council of the College, we cannot approve of the mode in which they have sought to bring it into practical operation. In the first place, the change in the constitution of the body has been effected far too suddenly. It should have been purely prospective. A certain form of examination should have been announced, to which every person, whether member or not, aspiring to the dignity of the fellowship, must submit, with the exception, perhaps, of the senior members, who might be admitted as

an act of courtesy due to their standing. The Council has chosen to arbitrarily select four hundred members as the senior fellows, without submitting them to any test whatever, or demanding the payment of any fee, the former of which all future aspirants must undergo, and the latter all successful candidates must produce. The principle which has been followed in the selection is not to be discovered; for, although eminent names are necessarily included, others of not the slightest note are there to be found; although some of the seniors of the profession are on the list, so is the member of yesterday; although the great bulk, especially of the first batch, are pure surgeons and lecturers, some of these are left out, and there is a sufficient sprinkling of general practitioners, suffering too the *taint* of midwifery, to show that exclusiveness of this kind was found unwise or impracticable. An arbitrary proceeding like this, where one member is raised above the head of his neighbours, without why or wherefore, confers no honour upon those selected, while it inflicts an unmerited degradation upon those who have been omitted.

We cannot agree with Dr. Davies, that the new Bill will remedy the defective operation of this Charter. The 18th and 28th clauses do not seem to confer upon any member, as he supposes they do, the right of registering upon the same footing as the newly elected fellow. We believe it will be found consistent with the tenour of the Act, in harmony with which the Charter has been prepared, that the Fellow shall register as "Surgeon," and the member, holding also the Apothecaries' license, as only "Licentiate in Medicine and Surgery." If we are correct, we much mistake if the great body of the members of the College do not peremptorily insist upon admission forthwith as Fellows, thus annulling at once the practical effect of the Charter, which, however beneficially it might have operated, both for the public and the profession, if its provisions had been more liberally carried out, can now be only looked upon as an instrument for the degradation of the great body of the members, in the arbitrary elevation, by a distinctive title readily understood by the public, of less than a twentieth portion of their number, without any ascertained right or qualification whatever.

Supposing, however, that the selection of Fellows had been made in a just and wise manner, we protest entirely against the *confining the election of the governing body of the College to their number*. Every member has as great an interest in the good government of the Institution as the Fellows can have. Science, especially Medical Science, is a bad theatre for Monarchy, Oligarchy, or Aristocracy! It will never flourish under such governments. If ever profession required or deserved that its members at large should have a voice in the election of its ruling council, it is that of Medicine. The people have a voice in the return of members to Parliament, and surely the commonalty of medical science should have a voice in the election of their own representatives. What, it will be remarked, give the elective franchise to members as Fellows? We say, why not? A ten-pound freeholder has as good a vote for the return of a member of Parliament as a five-hundred-pound freeholder; and, is it not insulting to the medical profession that its members should not possess an equal vote with its fellows or other functionaries? If the Members of the College elected their own Council at periodical intervals, the task of

selecting their Representative in the Council of Health might possibly be advantageously left to this body; or it might, upon so important an occasion, refer two or more names to the final decision of the members at large.

Mr. Green objects to the members participating in the election of the Council, upon grounds we should hardly have expected from the posessor of so philosophical a mind as his. After suggesting the establishment of an elective body still more restricted than the recent fellowship, inasmuch as they would be precluded from the practice of pharmacy and midwifery, he continues—

> "We cannot but anticipate the probability of its not satisfying those who are desirous of obtaining a share in the management of our college, and whose especial aim it is to give to the mode of election into the Council a more popular character. It would be idle to attempt to convince those who have been imposed upon by the unmeaning term *self-election*, which is only a false designation for the mode prescribed by the Charter for supplying vacancies in the Council by *selection*, that popular and open elections, besides being fraught with all the evils of faction and intrigue, would not be compatible with the permanent interests of a College, an institution for the promotion of science, or of the profession."

We do sincerely hope that the ruling powers of the College will shortly be prepared to meet the great body of the members in a more conciliating spirit, and a more just appreciation of their mutual interests, than this passage displays. It behooves an Institution, so dependent upon the good opinion of the profession, to be most careful in its movements. The proposition contained in the "Manifesto" of the general practitioners of Marylebone for the formation of "A College of General Practitioners in Medicine, Surgery, and Midwifery," which awhile since would have excited no more attention than have numerous similar projects, will be responded to, we doubt not, most extensively, if the College do not retrace its steps; and this is the more probable, as it seems to us a modification of some such institution must be erected upon the ruins of the Apothecaries' Act. The splendid income and large expenditure of the College will indeed wofully diminish, if the number of its admitted become confined to those whose intention it is to practise *pure surgery*—a retribution for the frequent anxious avowal by the Council of non-connexion with the great mass of their members, who are contaminated in their eyes by practising pharmacy or midwifery.

Providing a restrictive penal clause, such as we have suggested, be introduced into this Bill, we must consider the repeal of the *Apothecaries' Act*, contemplated by it, as a boon conferred upon the Profession; and we are at a loss to account for the extravagant encomia now so freely lavished upon that measure. The conjunction that has been effected between the Worshipful Company and its quondam most bitter vituperators is intelligible enough, upon the principle, that in a death-struggle one must not be too particular in rejecting allies, come they from whence they may: but we are alluding to resolutions passed at meetings of respectable practitioners, who have never indulged in vulgar invective or unjust aspersions. That the Society has done all in its power to work well this most defective Act we willingly allow, and that it has contributed to the advance-

ment of the condition of the General Practitioners cannot be denied; but to ascribe to it all, or even the greater portion, of their progress, is to reason *post hoc propter hoc* with a vengeance. The advancement of the general practitioner has only been simultaneous with that of other branches of the profession, favoured by no such tutelary power, and with the progress of science and art, not only in England, but throughout the civilized world, from the period it has been in the enjoyment of peace. "The Act of 1815, which first recognised apothecaries as legitimate practitioners was," says the Quarterly Review, "not the cause, but the consequence of the change which had taken place in their condition. And we have no hesitation in stating, that this Act has of late been obstructive to farther progress; and that had a better licensing tribunal existed, both the scientific and practical attainments of the mass of practitioners would have, ere this, reached a still higher point.

Whether we consider the nature of the education enjoined, or of the examination the candidate is submitted to, we see much that calls for amendment. A servitude of five years to a practitioner, and the early age at which candidates are admitted for the license, render the preliminary education, which most who are desirous of the elevation of our profession maintain the importance of, short and unsatisfactory. Such education would be best ensured by the abolition, or great curtailment, of apprenticeship, and the admission of the licentiate a year or two later than at present; for examiners cannot otherwise expect to discover in the youth what he has had neither time nor opportunity of acquiring. The Latin examinations at the Hall, for example, are a complete farce; youths who have never seen a Latin grammar, getting up, by the aid of a translation or grinder, their Celsus or Gregory, after their arrival in London, when their whole attention should be absorbed by their medical studies. Then, again, the attending the enormous number of Lectures which the Hall directs, implies a physical impossibility of devoting sufficient time to the dissecting-room and hospital wards—*i. e.* the most valuable sources of knowledge. Often have we sighed with regret in observing the industrious student passing hour after hour upon the benches of a theatre, noting and afterwards revising his lectures, while living specimens of every variety of disease, and opportunities for the study of the natural and altered structure of the frame, were passed heedlessly or hurriedly by. Every hospital physician and surgeon will testify how small is the proportion of students who devote a sufficient time to hospital duties. Then, worst of all, and as a necessary consequence of this mode of pursuing study, there is the unpractical and uncertain character of the examinations. It is a growing conviction among students, that these are no fair test of their qualifications; and the necessity which well-informed and most industrious students find themselves in to be *ground* into the routine answers they will be expected to give, is a significant sign of the necessity of change. When a man who has studied under no other teacher than the *grinder* passes muster, and the laborious student, who believed himself to be above the necessity of resorting to him, is rejected, it naturally becomes a subject of inquiry upon what basis does this system rest, and why is it continued? The Examiners are not chosen from among the licentiates at large on account of manifesting fitness for a difficult avocation, but by

seniority from among members of the Company. They are frequently engaged in active and fatiguing duties, are in some instances somewhat advanced in years, and in few or any are their names before the profession as cultivators of medical science or contributors of practical facts. A curious tribunal, indeed, to decide upon the claims of youths just fresh from the lecture-rooms and hospital wards, where the latest discoveries in science and improvements in practice are in course of teaching! Is it surprising that the student complains he hears opinions broached in the examination-room which he had long thought exploded, or that the *grinder* should flourish just in proportion as what is called the strictness of the examination is increased? After all the trouble taken to obtain it, the Certificate of the Hall is never looked upon by the student as a mark of distinction, or to be coveted for aught else than its allowing him to practise; while the Diploma of the College of Surgeons, for which a less laborious attendance on lectures, &c. is exacted, and a far less severe examination is endured, is regarded by its possessor as an honour. It is so, because he feels his examination has been practical, and conducted by men of great eminence in that branch of the profession, and has been passed, that is to say if he has been moderately industrious, without the degrading aid of the grinder.

We repeat, we do not mention these circumstances as condemnatory of the Society of Apothecaries, whose act crippled their will and power to be serviceable. Indeed, it can only be the conviction of their having done as well as it permitted them, that has allowed the long continuance of the anomaly of the great body of general practitioners deriving their right to practise from a trading corporation, which possessed no claim for taking the lead in so momentous a matter. The General Practitioners who associated for the protection of their interests in 1812, had a far better idea of the requirements of their class, than those have who now propose a mere modification of the Apothecaries' Act. They proposed the licensing tribunal to be formed of Physicians, Surgeons, Apothecaries, and General Practitioners; and a board so constituted, and equitably adjusted, seems to us to afford the best chance for ensuring the efficiency and respectability of the examination. The confining the examination of the practitioner to his own grade, as recommended by the "Manifesto," we think would be most injudicious. Engaged in the active duties of the profession, men of eminence of this class have little time to devote to the cultivation of its scientific departments, and are even sometimes ill-informed as to its actual progress. Admirably fitted for the more practical portion of the business, they should call to their aid, from the schools and hospitals, those who, from being engaged in the business of teaching, are best able to test the progress the student has effected, and the use he has made of the opportunities he has been invested with. For furnishing their quota of this examining body, as also for supplying a head to this portion of the Profession, some description of Incorporation of the General Practitioners, quite independently however of the Society of the Apothecaries, governed by its elective Council, and represented in the General Council of Health and Education, seems essential.

The provision in the proposed Bill, for a general superintendence of the Education and Examination of candidates by the Council, is excellent,

and has been long needed. The expediency, and justice too, of allowing the man who has passed his examination before, and paid for the license or diploma of any of the licensing bodies, to practise in any part of the United Kingdom he sees fit, but *without any additional fee or charge*, must be obvious.

To allude to the pamphlets mentioned at the head of this article. The two first, as we have stated, deserve a careful perusal, especially Mr. Green's, in reference to the imparting a more scientific bearing to the Profession, which he justly thinks so desirable. The "Statement" and "Address" of the Society are in every body's hand, but will fail to convince, we believe, the great body of the Profession of the expediency of replacing this body at its head. The "Manifesto" is a sturdy denunciation of the Bill, and a demand for a separate incorporation, which it seems to us it would be the wiser course to seek to engraft on to the amended Bill. The Speech of Dr. Hastings and letter of Mr. Carter are temperate exposures of the alterations which are necessary to render the Bill satisfactory. Dr. Davies' "Exposition" contains a succinct account and criticism of the Laws which have hitherto governed the Profession, and in the Appendix an Analysis, or rather a Eulogium, of Sir James Graham's Bill, which it would seem, from his account, is perfection itself—a sentiment in which he will find few to participate.

The title of Dr. Thomson's *brochure* is not the most happy. We *repudiate* our wives—but not till after legal marriage: we *repudiate* our debts —but not till after they have been fairly contracted. But if Sir James Graham once rivets the chains of his Bill on the Profession, they will find it no easy matter to *repudiate* afterwards. No: *oppose* the Bill as much as possible, for we do not consider you have the power to repudiate or reject it, just because you do not like it. The Government is so strong, that they could carry a Bill authorizing every third birth to be destroyed, like a kitten, in the nearest pool or stream. Let not the Profession think themselves omnipotent, or they may awake, some fine morning, and find that the Home Secretary has been up before them. We are old enough to remember the *effervescence* produced from one end of the isle to the other, by the agitation among the "Surgeon-Apothecaries" prior to 1815—the memorable millennium of the General Practitioners! The Medical Reform Bill of that year was hailed with almost as much exultation as the Parliamentary Reform was in 1832. Now both reforms are trodden under foot, execrated—and REPUDIATED!

We suspect the author of this pamphlet is "clean daft." It appears that he addressed a memorial to Sir J. Graham, last year, in which the following passage occurred, and which is considered so important as to be reproduced in the present brochure:—

"Thus Education has to proclaim to mankind, that of all punishments inflicted upon civilized humanity, the most tremendous are inflicted by what is called the medical profession: that medical men, as permitted, authorized, and protected by the laws, usages, and ignorance of Governments, corrupt, torture, murder more helpless, unsuspecting victims, than a permanent cholera could ever reach; for every ten destroyed by war, medical men sacrifice twenty. Education looks forward with horror to the additional terrific incubus about to be immediately inflicted by Sir J. Graham."

The author is in a great rage with Sir James Graham for having apparently neglected his memorial. We are ourselves a little surprised that the Home Secretary should have forgotten so delectable a specimen of dogmatism! We apprehend it could hardly be paralleled in the "Annals of Medicine," which title he gives to his present memoir. We are inclined to the opinion that, were there not a single drug or a single doctor in existence, the rate of mortality would be little, if at all, increased. For if we endeavour to form some estimate of the number of people who are destroyed by quacks—by quacking themselves—and by the mistakes of the rash and the inexperienced, we shall be very likely to conclude that these contingencies pretty nearly balance the account against the number saved by regular advice. This, however, is a very different calculation from that which Dr. Thomson has formed.*

A DICTIONARY OF TERMS USED IN MEDICINE AND THE COLLATERAL SCIENCES. By *R. D. Hoblyn*, A.M. Sherwood, 1844. Second edition.

WE hardly remember to have seen so much valuable matter condensed into such a small compass as this little volume presents. The first edition was published in 1835, and the present may be said to be almost rewritten, introducing the most recent terms on each subject. The Etymology, Greek, Latin, &c., is carefully attended to, and the explanations are clear and precise.

In a large Appendix, Dr. H. has introduced several subjects of great utility to the student and practitioner. The first is headed "AFFIXES," in which are exhibited the principal *affixes or terminations* of words, in connexion with their compounds, which will be found to be a great aid to the memory. The next article is on Botany, and comprises a sketch of the artificial or Sexual System of Linnæus—also a sketch of the Natural System, and a Glossary of the adjective terms employed in Botany. The third article, on CLIMATE, is abridged from the work of Sir James Clark. A Posological Table, carefully compiled, succeeds; and then Materia Medica—Patent Medicines—Physiology—Toxicology—Vascular System—Weights and Measures—and, lastly, Zoology.

We cannot too strongly recommend this small and cheap volume to the library of every student and every practitioner.

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* We omitted to observe in its proper place in this article, that the present Bill is farther defective, as containing no provision for the education, examination, and representation of the Chemist and Druggist, and for the examination of persons practising Midwifery. All these matters should be included in one comprehensive scheme of "Medical Reform."

Periscope;

OR,

CIRCUMSPECTIVE REVIEW.

" Ore trahit quodcunque potest, atque addit acervo."

Spirit of the Foreign Periodicals.

A New Classification of Cutaneous Diseases.

M. Devergie is one of the Physicians of the St. Louis Hospital in Paris, and enjoys, therefore, an immense experience in the observation and treatment of cutaneous diseases. As a reason for proposing the following arrangement, he says that "every day medical practitioners send to me patients affected with what they most vaguely call *dartres*, without the species of the disease being even so much as named. This much-abused appellation unfortunately always suggests the use of sulphureous and depurative medicines—a class of remedies which very often exasperates, instead of curing, the existing skin disease."

Nosological Table of Cutaneous Diseases.

I. Secreting Diseases.

A. *Serosity.*
Eczema.
Pityriasis rubra acuta.
Eczema lichenoides.
Scabies (gale).
Herpes phlyctenoides.
Pemphigus.

B. *Purulent serosity.*
Eczema impetiginodes.

C. *Purulent and sanious serosity.*
Rupia.
Ecthyma cachecticum.

D. *Pus.*
Impetigo.
Acne.
Scabies (gale).
Ecthyma.
Sycosis.

E. *Fatty matter.*
Acne sebacea.
Acne punctata.

II. Non-Secreting Diseases.

A. *Transitory* redness.*
Erythema.
Urticaria.
Roseola.
" Couperose erythemateuse."

B. *Permanent redness.*
Purpura.
Scorbutus.

C. *Redness with a papular state of the skin.*
Lichen.
Strophulus.

D. *Circumscribed redness with furfuraceous scales and a fretted state of the skin.*
Herpes circinatus.
Herpes nummularis.

E. *Diffused redness with a furfuraceous state of the skin.*
Pityriasis rubra.

F. *Redness with induration of the skin and with scales.*
Psoriasis.
Lepra vulgaris.

* *i. e.* Disappearing under the pressure of the finger.

G. *Scales without redness.*
Icthyosis.

H. *Papulæ without redness.*
Lichen chronica.
Prurigo.

I. *Vegetable productions.*
K. *Animal productions.*

A. In *eczema*, the serous secretion oozes from a red surface, by myriads of little canals or openings, in the form of minute drops, or fine moisture.

In *acute pityriasis* the serous oozing is a sort of sweat, but without any perceptible punctuated state of the skin.

In *eczema lichenoides*, the serosity proceeds from a rounded patch, which is sprinkled over with a multitude of papulæ that render the surface somewhat rough. The discharge is exhaled between the papulæ.

In *scabies*, the serosity is contained in minute isolated Vesicles; whereas,

In *herpes phlyctenoides*, it is within Bullæ, that are either distinct and separate, or are situated so near to each other as almost to touch. In *pemphigus*, the bullæ are still larger.

B. There is one disease only, viz. *eczema impetiginodes*, in which the secretion is partly serous and partly purulent at the same time. The product of this secretion is a crust of a yellowish-gray colour.

C. In *rupia* and *ecthyma cachecticum* the secreted matter is partly purulent and partly sanious. In the former, the crust, that is subsequently formed, has an ill-favoured appearance—being formed of pus, ichor, and blood—and is always more or less irregular in its form. In the latter, the crust exhibits the same characters, but it rests upon an inflamed base, and retains the rounded shape of the pustule which preceded it.

D. Among the cutaneous diseases in which the secretion consists entirely of pus, *impetigo* is alike the most common and most important: its crusts are always purulent, superficial, and of a gold-yellow colour, not unlike that of concrete honey.

In *acne*, the pustules are hard at the base, and elevated; in *purulent scabies*, they are flat and more uniform. In *ecthyma*, the pustules are flat and of a large size, and exhibit in the middle a dark point, which gradually becomes more and more depressed, so that at length they are umbilicated, as in small-pox.

We must pass over the remaining family of this section, and all those of the other or non-secreting class, till we come to the last two groupes of the series—viz. the Vegetable and Animal Productions of the skin. Among the former, are enumerated the three varieties of genuine *tinea* or *favus*, viz. *f. scutulata*, *lupinosa*, and *granulata*; also the *porrigo decalvans*, and *herpes tonsurans*. Much skill and experience are required to discriminate these affections.

The *animal productions* comprise the *pedicular* disease, and that which engenders the *pulex* or flea.

M. Devergie promises to show, in a subsequent article, the practical bearings, in a therapeutic as well as in a diagnostic point of view, of the classification which he has proposed:—the treatment required for *secreting* diseases of the skin being very different from that which is suited to those that are *non-secreting*.—*Bulletin General de Therapeutique.*

The Plague in Egypt; its Causes.

From a memoir on this subject, recently read before the Academy of Medicine

by M. *Hamont*, we select the following picture of the loathsome condition in which a large portion of the population of Egypt is living, even in the present day.

"I have passed," says he, "fourteen years in that country, and I have studied the disease with all possible care. It is truly endemic there; no one disputes the fact; and the cause of its being so, it is not difficult to explain. The plague reigns exclusively in what is called Lower Egypt—a region where every imaginable condition of insalubrity is found combined; and that too in a degree which it is not easy for any one to credit, if he has not himself been an eye-witness. The dwellings of the *fellah* population are constructed of mud, and are usually situated beside some stagnant and putrid water. They are common alike to men and beasts; and when night comes, all the inmates lie down together on some filthy straw, with nothing but still filthier mats to separate them. The very ordure on the floor is removed only for the purpose of hanging it up in lumps from the walls to dry: this serves for fuel! Judge of the stench that must arise from this novel species of combustible matter. Then again the horrid miasms from putrid carcases of different animals lying round the walls, and perhaps also from the bodies of human beings buried only a few inches underneath the surface. Who, but a *fellah*, could endure such horribly offensive scenes?

"When, in consequence of the excessive mortality from the Plague, the living are insufficient to inter the dead, the bodies are carried away in heaps upon a bier to the cemeteries, and there left to rot in the open air. The villages, that are in short nothing better than a heap of privies, are usually surrounded with a belt of rubbish, as if actually to prevent all chance of ventilation! Often the traveller knows that he is approaching some dwellings, only by the very exhalations that corrupt the air around. And yet the poor ignorant inhabitants will refuse all advice or the suggestion of any change; nay, they treat as impious whosoever ventures to propose it, telling you that, do what you may, death will come at his appointed time! * * * * * *

"Three-fourths of the population live on tainted meat—the flesh perhaps of animals that have died of carbuncle—on old rotten cheese, putrid fish, leaves of radishes and other vegetables; and in some districts on rats and locusts. Such is the common food of this wretched people—the slaves of a most cruel despotism.—*Comptes Rendus.*

THE THERAPEUTICS OF NATURE.

"THERAPEUTICS, it is very generally admitted, is one of those branches of medical knowledge in which there exists the greatest amount of errors, defects, and prejudices; and where experience is alike most difficult and deceptive. The mistakes, that are daily made, are often far greater than we are willing to admit. And then, how little do we know of the extent of Nature's own curative resources, and how much she will often effect, unaided by, or perhaps even in spite of, the interference of art. In the practice of our profession, it should ever be borne in mind that we have to do, not only with the existing disease, but also with the conservative and reparatory efforts of Nature,—which, by itself, is often sufficient to produce a cure. Hence those reputations of medicines and modes of treatment, which so rapidly start up and are as quickly forgotten; and hence those false gods of Therapeutics, that to-day are adored, and to-morrow are despised."—*Bulletin de Therapeutique.*

On the occasional Pulsation of the Veins.

It is not to that pulsation of the jugular veins—which depends upon a reflux of part of the blood from the right cavities of the heart, in consequence of the imperfect closure of the tricuspid valve—that the following remarks are applicable. "Our present object," says M. *Martin Solon* in his communication to the Royal Academy, "is to draw attention to a pulsatory movement that we have occasionally observed in the veins on the back of the hand—a movement, that is dependent upon an isochronous continuation of the arterial pulse, and which, therefore, truly deserves to be considered as a pulse of the veins." The first instance, in which he observed the phenomenon, was one of severe Pneumonia, after the patient had been largely bled. On the fifth day, the dorsal veins of each hand were perceived alternately to swell up and to subside, as is the case with any superficial artery. The pulsations were distinctly isochronous with those at the wrist. It was abundantly obvious that the movements of the veins were quite independent of those of the neighbouring arteries, and of the agitation of the subjacent tendons. When the Brachial artery was firmly compressed, the pulse in the veins, as well as in the radial and ulnar arteries, was at once suspended. In this instance, the phenomenon in question was observed for six or seven days successively. M. *Solon* expressed his conviction, that the venous pulse was in short nothing else but the continuation of the ordinary arterial one, communicated from the arteries directly to the veins. It is not improbable, he very justly remarks, that, in order that this phenomenon may occur, the circulating fluids should be in a more attenuated condition than they are in a state of perfect health. That such is probably the case, is rendered still more likely by the results of the second case—one of Typhoid fever—related by him.

Dr. *Graves* also has had occasion to observe a distinct pulsation of the veins in two cases of active inflammation, in both of which blood-letting had been already freely employed; and Dr. *Ward* too has seen it in a woman recently delivered. It would seem therefore that the phenomenon in question is decidedly connected with an attenuated state of the blood.

M. *Cruveilhier* stated that he had never seen any appearance of pulse in the veins of the hand, although the phenomenon in question was not at all uncommon in the veins at the bend of the arm. He had indeed more than once, in consequence of the vein in blood-letting throwing out its contents in jets, been apprehensive that the artery was wounded; but such an accident had never occurred in his practice. He attributed the phenomenon of the venous pulse, in all cases, to subjacent arteries communicating their movement to the veins; and never to any direct transmission of their pulsations along their capillary extremities.

M. *Velpeau* alluded to a case of Typhus fever, in which all the superficial veins in both upper extremities were moved with most distinct pulsations, that were certainly not owing to any shock communicated to them directly by subjacent or neighbouring arteries. On the whole, he was inclined to attribute the phenomenon to the reflux of the blood backwards from the heart, along the subclavian and brachial veins. But, as M. *Solon* remarked, how could this explanation hold in his two cases, where there was no pulsation of the brachial and anti-brachial veins, but only of those of the hands?

M. *Blandin* expressed his entire concurrence in the opinions of M. *Solon*. He alluded to the circumstance that, two centuries ago, *Harvey* himself had distinctly asserted that the heart will sometimes transmit its pulsations even to the veins: and he then mentioned some experiments which M. *Magendie* and he had performed, and which tended to establish the truth of this position. If a part of the circulatory system be emptied, (in the dead body,) by means of a first injection pushed in with force, and then a second injection be thrown in, by jerks, into a large arterial trunk, we shall find that it will escape from a wound in any

one of the principal veins of that system, in jets, as from an artery. If this can be done in the dead body, why should we deny the possible occurrence of it in the living?

M. *Dubois* intimated his dissent from these views, and agreed with M. *Cruveilhier* in ascribing all venous pulsations, either to the shocks communicated from the contiguous arteries, or (in some cases) to the reflux of the blood along the jugulars.—*Comptes Rendus.*

ON THE USE OF THE THYMUS GLAND.

DR. *Picci*, after glancing at the theories of his predecessors, suggests that the use of this Gland is chiefly of a mechanical nature; viz. to occupy a certain space within the thoracic cavity, while the lungs remain unexpanded in the fœtus; and thus to prevent the ribs and sternum from falling in too much upon these vital organs. The size of the Thymus is inversely as the volume of the lungs; and, when the latter become dilated after birth by the admission of air into their cells, the former immediately begins to shrink and become atrophied. In truth, it is only in the adult that the thoracic parietes are moulded completely upon the lungs; for, in infancy and youth, it is rather the Thymus gland that is, in their place, moulded upon the thorax.

The situation of this gland in the anterior mediastinum and along the median line, the very nature of its tissue, and the greater expansion and development of its inferior half, are adduced as arguments in favour of the opinion now adduced. Besides the well-known circumstance that, in those new-born children in whom the thorax is very largely developed, the Thymus continues to increase gradually even to the end of the second year, it deserves notice that all those animals, in which the lungs are similar to those in the human subject, are provided with this gland; whereas, we find it to be entirely wanting in those which breathe by Branchiæ or membranous lungs. In hybernating animals, also, the Thymus exhibits alternations of enlargement and decrease, according to the state of the respiratory organs. In the Amphibia it attains its maximum of development.

The circumstance too of the gland being usually rather larger than ordinary in phthisical patients may be mentioned as lending some probability to the view we have proposed.—*Annali Universali.*

SPONTANEOUS EXPULSION OF THE OS HYOIDES.

A MIDDLE-AGED woman, of a rachitic constitution, became affected with an enlargement of the glands around the lower jaw, accompanied with a slight cough, and disturbance of the breathing. In spite of treatment, these symptoms went on gradually increasing, for three or four years. The sputa became thick and viscid, and were occasionally streaked with blood; the patient was every now and then distressed with attacks of suffocative dyspnœa, and her strength was greatly exhausted by colliquative sweats. The voice was at length completely extinct; and now there was a fixed pain, with an almost continual sense of pricking, in the laryngeal region. The sputa were at this time very decidedly purulent, and were often rejected without any effort of expectoration: it was a simple expuition that followed immediately after a lacerating pain felt in the throat.

The condition of the patient had for a length of time appeared quite hopeless, when most unexpectedly—after experiencing more than usual suffering from the cough, dyspnœa and pricking pain in the throat—she expectorated, in the midst of a convulsive agitation of the whole body, a firm hard substance, which proved

to be a bone of considerable size. On being examined, it proved to be the *os hyoides*. The health of the patient speedily improved, and was ultimately quite restored—five years after the commencement of her first suffering. The bone was examined by several members of the Academy, so that no reasonable doubt as to its nature can be entertained.—*Comptes Rendus.*

SURGICAL MEMORANDA BY M. VIDAL.

I. *Luxation of the First Phalanx of the Thumb.*—The reduction of this accident is almost always extremely difficult. A variety of suggestions have accordingly been proposed to effect the object in view. Shortly after I arrived (says our author) in Paris, a case of Dislocation of the Thumb backwards was brought into the Hôtel Dieu: every imaginable attempt to reduce the displacement was ineffectually tried. M. *Dupuytren* delivered a lecture upon the accident, and endeavoured to prove that the irreducibility was caused by the altered position of the lateral ligaments of the joint: these bands, in consequence (he supposed) of having become stretched in an oblique direction, bound down the digital bone against its metacarpal fellow. Upon that occasion, I showed that the real obstacle was a *boutonniere* of muscular substance, which strangulated the head of the metacarpal bone, and became the more and more tightened in proportion to the force with which traction was applied to the displaced phalanx. This impediment is formed on the outer side by the external portion, and on the inner side by the internal portion, of the small *flexor pollicis* and *adductor brevis*. As the heads of these muscles are inserted into the upper extremity of the first phalanx, they are necessarily forced backwards along with the dislocated bone, and the upper metacarpal protuberance is thus held fast between them. To effect the reduction, tractions in a variety of directions had been (as already mentioned) tried for a length of time; but all in vain. I proposed to cut away the head of the metacarpal bone; but the suggestion was not, and perhaps wisely, adopted. M. *Malgaigne* has more judiciously suggested that it would be better to divide the external portion of the *boutonniere* or strangulating muscular band.

II. *Vesico-Vaginal Fistula.*—M. *Vidal* has proposed, in unmanageable cases of this most distressing accident, to obliterate the orifice of the vagina entirely, so as to convert this canal into a blind passage, and thereby to prevent the issue of the urine from it. This idea was suggested to him by the accidental effects produced by the nitrate of silver having been applied rather too freely to the anterior and posterior walls of the vagina, in a case where the use of a suture to the fistula had failed, and the application of the caustic had been tried instead: the opposite walls of the vagina joined together, and quite prevented the escape of any fluid from its orifice. The result was, that the urine flowed from the urethra. This state of things continued for nearly a fortnight. Unfortunately, upon endeavouring to ascertain, by means of a manual examination, the state of the parts, the feeble adhesion of the vagina gave way, and the urine again began to escape from its orifice.

In this, and indeed in almost every case of vesico-vaginal fistula, a great obstacle to the cicatrization of its edges is the fact that the bladder has usually become so contracted upon itself, that it is unable to hold any considerable quantity of urine. The fluid is therefore continually escaping from the ulcerated opening; and, when the discharge is obstructed by suture, the patient is distressed with most frequent calls to micturition. The effects thus induced very materially interfere, as a matter of course, with the process of healing: and unfortunately too, the leaving of a catheter in the bladder does not answer well, in consequence of the contracted state of the cavity of this organ.

M. *Vidal* has once carried his proposal into effect, in the case of a woman, 35 years of age, in whom the vesical fistula was so large as to admit the introduction of several fingers through the ulcerated opening, into the bladder. After paring the edges of the vulvar orifice of the vagina, he passed three stitches through the internal *labia*, and tied them over two pieces of bougie, in the usual manner of forming a quilled suture. Next day, the urine was voided by the urethra; and, for nearly a month, not a drop made its escape from the vagina. The catamenia, also, during this period, passed along with the urine from the urethra. Most unfortunately, a difficulty in passing the water having come on, one of his pupils made an attempt to introduce a catheter into this canal, and pressed too strongly against the vaginal cicatrix. The result was, that the adhesion gave way; some blood was discharged at first, and subsequently urine came away by the wound.

M. *Vidal* closes his remarks in these words:—"The difficulty of closing the orifice of the vagina is indeed real; but to say that it is impossible, is nothing but a vague assertion. The objection that I deprive the woman of 'son plus bel attribut,' that I rob her of her sex, and prevent her from ever conceiving afterwards, is one that it is quite needless for me to reply to."

III. *Lithotomy 'en plusieurs temps.'*

In my opinion, says our author, the infiltration of the urine into the surrounding tissues, is the most formidable accident that is liable to occur after this operation. After a wound of the bladder, the urine comes immediately in contact with a loose, and therefore very infiltrable, cellular tissue. Now, if nature does not re-act with energy, and if there be not promptly formed a sort of protecting eschar upon the surface of the incised parts, the effusion of the urine will take place, and death is then almost inevitable. To prevent this accident, it should be our effort to render this cellular tissue less lax and permeable; and this can only be done, with any prospect of success, before the urine is allowed to escape from the bladder. *Eh bien!* this most desirable result may be obtained, if the operation be performed at several times; if the skin and subjacent tissues down to the bladder be divided at first; and the section of the bladder be not made until after the organic re-action, which changes the physical and vital conditions of the surrounding parts. The first time or step in the operation, in some cases and in certain subjects, might be effected by means of caustic; but certainly the knife is very generally to be preferred.

IV. *'Debridement Multiple' applied to the Operation of Strangulated Hernia.*

M. *Vidal*, after having pointed out the advantages of the bilateral and even the quadrilateral incision of the Prostate Gland in some cases of Lithotomy—proceeds to point out the applicability of a similar method of proceeding in the operation for relieving a strangulated bowel. Every one is aware that, in certain cases, where there is an anomalous distribution of the *epigastric and obturator* arteries, great danger of an alarming hæmorrhage is incurred, if the incision of the ring or aperture be prolonged too far in any one direction. Now this risk may, in a very great measure, be avoided by making a number of nicks or little incisions, in place of a single one, that is more free and extended. It is unnecessary to enter into further details; all that is necessary is to suggest the hint.

(The hint is far from being a novel one; it will be found in most of the standard works on Operative Surgery.)

REMARKS ON AMBULANT OR ERRATIC ERYSIPELAS.

"THE epithet applied to this form of Erysipelatous inflammation designates its characteristic feature. The cutaneous affection propagates itself by irregular impulsions. In one case it attacks a part which it speedily quits, without passing through its successive stages; and in another, the disease exhibits all the phases of its complete evolution in the part that is primarily seized. Not obedient to any regular march, it leaps from one region to another, without implicating the intermediate parts; or it suddenly vanishes from the skin, to fasten itself upon some internal organ. The inflammatory action usually does not penetrate deep; it but skims the cutaneous surface. The danger, therefore, of this form of Erysipelas arises not so much from the extent or severity of the dermal lesions, as from the risk of metastasis of the morbid action to some important viscus, and from the cachectic state of the general health.

Erratic Erysipelas may terminate in various ways. In the majority of cases, it proves fatal. It very rarely terminates by simple resolution and by a *direct* return to health. A fortunate termination of the disease is usually accompanied or followed by some critical evacuation, as a hæmorrhage from the nose, a profuse perspiration, a copious flow of dark-coloured urine, or by a severe diarrhœa.

Occasionally—but this termination has been but little attended to—the critical effort seems to consist in the development of numerous subcutaneous Abscesses, unpreceded by any inflammatory action in the parts so affected.

This lesion must not be confounded with the suppuration of the subcutaneous cellular tissue, that is not unfrequently the consequence of *phlegmonous* Erysipelas: in the *ambulant* form of the disease, the inflammation is strictly superficial, and the subjacent cellular substance is not involved in the morbid process.

In the two cases related by *M. Tanquerel*, erratic Erysipelas had continued for upwards of three weeks, and, being accompanied with Typhoid symptoms, threatened great danger; when, suddenly, a number of small indurated tubercles were perceptible under the skin of the neck and chest—the cutaneous inflammation having left these parts a few days before, and attacked the lower extremities. On the following day, many of these tumours presented a distinct sense of fluctuation. In one case, as many as forty-three of these boils or subcutaneous abscesses formed in the space of three weeks. The size of them varied from that of a small nut to that of a pigeon's egg.

They were developed without any previous heat, pain, or redness in the parts affected; and even their existence was often not recognised, before it was found that purulent matter was already formed in them.

From the moment that the earliest abscess was formed, the Erysipelas ceased to make any further advance beyond the part where it happened then to be; and soon afterwards it ceased altogether.

We need scarcely say that the convalescence from such an attack must always be very tedious. There was no reason to suppose that, in either of the cases which occurred to Dr. T., there was any existing Phlebitis,—a lesion which is so often associated with, if it be not the immediate cause of, those *metastatic abscesses* which are generally referred to what has been called, of late years, a Purulent Infection of the System. It is more than probable that there is always present, in both sets of cases, a morbid alteration of the circulating fluids; although we are not yet prepared to say in what this alteration consists."—*Journal de Medecine de M. Beau, Sept.* 1844.

PROFESSOR TOMMASINI ON CHRONIC ARTERITIS AS A CAUSE OF MANY DISEASES.

THE intimate connection between Rheumatism and an inflamed condition of the heart and arterial blood-vessels has been recognised by many of the most eminent pathologists of the present day. *Rasori*, indeed, has denied that the arteries are susceptible of inflammation; but in this opinion he is unquestionably wrong.

"Since the year 1806," (we quote the words of the proto-physician of Parma,) "my attention has been directed to those morbid vibrations which the arteries sometimes exhibit, and which often occur without being accompanied by any heat or dryness of the surface, redness of the face, or any other symptom of fever. This phenomenon is announced by a monotonous frequency of the pulse, continuing for months, and, it may be, for years; the patient perhaps all this while presenting no symptom of organic disease in any part of the body; and even dissection (for I have seen a good many die in this condition) not disclosing any satisfactory alterations of structure, to account for it."

These arterial vibrations are of frequent occurrence in Chlorotic females, in whom the catamenia have been for some time irregular, and in patients who have lost much blood, either by spontaneous hæmorrhage or by artificial depletion. They are occasionally observed also in the large arteries of an amputated stump, after all the fever and suppurative inflammation have ceased. In women, too who have been recently confined, and in children subject to Epistaxis, the pulse is generally found to be more or less vibratory and rapid: the same occurs after frights and great mental disquietudes, in cases of Dropsy of the Pericardium, also, and in Hysterical and Hypochondriacal affections. In the last-named maladies, the patients are often affected with such violent vibratory pulsations in the Epigastric region, that they fancy that they must be labouring under aneurism of the abdominal aorta.

"The question now comes to be," says the Professor, "what is the cause of the phenomena alluded to? In no work of medicine, ancient or modern, is there, to my knowledge, any satisfactory explanation of it proposed.

"In my opinion, it is attributable to a chronic phlogistic condition of the vascular system: the experience and observation of many years have tended to confirm more and more my belief in this doctrine. The inflammatory action supposed to be present, is—be it remembered—not only chronic in its nature, but in the *minimum* degree of force: it may therefore continue for a great length of time, without inducing almost any disturbance of the general health. But if it be aggravated by injudicious treatment, organic changes of the affected tissue may be gradually brought on."

* * * * * *

"I have remarked," continues he, "in all diseases termed leucophlegmatic by the older physicians, and especially in Chlorosis, in which there is so marked a tendency to œdematous tumefaction of the cellular tissue, that there is a slow chronic arteritis, which in my opinion is to be regarded as the cause of all the phenomena of the malady. The vibratory character and great frequency of the pulse are symptoms well known to every medical practitioner. There is the most intimate alliance between the leucophlegmatic colour of the skin and the swelling of the cellular tissue, and this phlogistic condition of the arterial system; although, on first consideration, we might anticipate a very different result, and expect that, as the circulation of the blood is so very rapid, the lymph, instead of being effused into the cellular substance, would be carried along in the sanguiferous vessels."

Several cases are related with the view of confirming these pathological views. We shall give brief abstracts of two of them, before we offer any criticisms.

Case.—A man who had been long addicted to the use of stimulating liquors, was seized with dizziness and other symptoms that indicated plethora in the head. He was freely bled, and kept on a low diet. A month or two afterwards, his appearance was very seriously altered; he was then pale and had a chlorotic aspect; the skin was puffy and seemed to be bloated; he complained of a distressing sense of heat in the chest; his pulse, which was formerly soft and slow, was now exceedingly rapid, and had a sort of *metallic vibratory* movement; but there were no palpitations of the heart present, nor any decided difficulty of breathing; except indeed upon any bodily exertion or mental disquietude; and then the heart throbbed violently, the breathing was hurried and distressed, and the vibratory character of the pulse was unusually strong. I advised him to be bled, to take pills of aloes and squills, and a chalybeated cream of tartar: the patient, however, refused to be bled, as he attributed all his present suffering to the large losses of blood which had been practised on a former occasion. Subsequently he died of Hydrothorax. "I feel convinced (says *Tommasini*) that, if the body had been examined, the chief morbid appearances would have been an inflammatory state of the arterial system, indicated by redness and congestion of the inner surface of the blood-vessels, thickening of their parietes, and transudations here and there of concrescible lymph."

Case 2.—A young nobleman had for some time been subject to attacks of violent hæmoptysis, but without ever exhibiting any of the characteristic symptoms of Phthisis. He had no cough (except when these attacks occurred), nor fever; and yet his pulse was more vibratory, metallic and thrilling than I had ever felt before: it was also very rapid. Blood, drawn from the arm, was so highly fibrinous that it became covered with a thick buffy coat, in an unusually short space of time. Besides these well-marked symptoms of Arteritis, this patient exhibited all the appearance of a genuine Chlorosis. He died during a severe access of pulmonary hæmorrhage.

The Professor admits that most medical men would have attributed the vibratory character of the pulse and the other symptoms in the preceding cases to the weakness and a tonic irritability of the vascular system, induced by the losses of blood; but he argues against this opinion on the following general grounds: How comes it, for example, that a young girl, previously in good health, should, in consequence of the stoppage of the catamenial discharge, become affected with Chlorosis? Surely the mere arrest of this sanguineous evacuation ought not to induce the characteristic features of this disease. Again, do we not observe that a patient, affected with any acute inflammation, may lose ten times the quantity of blood—in the same, or even a shorter, space of time—that another patient loses spontaneously, *i. e.* by some hæmorrhagic disease? and yet the former is not found to exhibit the chlorotic appearance and the vibratory condition of the circulation, which are so often observed to exist in the latter. "I do not mean to deny," says *Tommasini*, "that these phenomena may be induced by excessive sanguineous depletions; but what I insist upon is, that often, in hæmorrhagic patients, we confound the effects of the loss of blood with the pre-existing and essential condition of the malady; and that, in very many cases, the leuco-phlegmatic habit is intimately connected with a morbid condition of the blood-vessels; in short, with a chronic inflammatory state of these parts."

The altered state of the blood is attributed by our author, in part, to the morbid state of the vessels themselves, and in part also to the disturbance of the digestive function; and the tendency to the serous effusions is made to depend upon the intimate alliance between the blood-vessels and the lymphatics, so that whenever one system becomes disordered, the other invariably suffers.

Professor *Tommasini* then adduces a multitude of cases of Hypochondriasis and Hysteria, in which—alike from the symptoms during life, and (in certain cases) from the morbid appearances found in the aorta on dissection—he contends that there was a chronic inflammation of the arteries present.

"For the last thirty years," says he, "I have taught in my lectures that chronic Angeioitis is the principal cause of flatulences, nervous disturbances, and hypochondriacal affections, or, at least, that it is most intimately connected with these morbid states; and certain it is, that I have often diagnosticated the presence of the lesion in question, in cases where it was never suspected by the other medical attendants, and have afterwards positively ascertained its existence by dissection, to the surprise of those who followed my clinical practice at the time. In most of these cases, the abdominal aorta pulsated with a strong metallic vibration, the complexion of the patient was unhealthy and pale, and the digestive functions were more or less disordered. * * * * * In spite of the symptoms of gastritis, dyspepsia, flatulence, gastralgia, hypochondriasis and hysteria that were present, I have often detected the cause and source of all the existent mischief, by merely laying my hand upon the epigastric region."

He subsequently qualifies these statements very materially, by admitting that all the phenomena of these diseases may be present, without any real or idiopathic affection of the arterial system; but nevertheless he re-asserts with earnestness his opinion that Angeioitis is of much more frequent occurrence than is generally admitted by pathologists.

The numerous and intimate connections between the nerves that supply the heart and the large intestines on the one hand, and the abdominal viscera on the other, are sufficient, he thinks, to account for the close sympathies that exist between the functions of the Circulatory and Digestive organs, in various diseases, as well as in a state of health.—*Annales de Therapeutique et de Toxicologie.*

Remarks.—The pathological doctrines here propounded are, on the whole, so utterly at variance with those almost universally held in this country, in respect to the diseases alluded to, that it is scarcely necessary to do more than simply direct our readers' attention to the subject. That Chlorosis and hæmorrhagic diseases, when accompanied with a vibratory pulsation of the heart and great arteries, and a tendency to subcutaneous œdema, are generally to be regarded as the effects of a slow chronic Angeioitis, is a position that few English physicians will admit. The practice of Professor *Tommasini* is a little better than his theory. Occasional bleedings, and the use of digitalis, squills, colchicum, nitrate and acetate of potash, aloes, and steel (for this also is considered to be a *contra-stimulant*), are the chief remedies which he recommends. With respect to this alleged action of steel, it may be worthy of notice that we have frequently had occasion to remark, that the opinions of Italian physicians, as to the action or *modus operandi* of certain medicines on the system, are quite antipodal to those held by the medical men of other countries. In one of the Numbers of the *Gazetta Medica di Milano*, during the last year, we find a Dr. Mattii publishing several cases of Pneumonia and other actively inflammatory diseases, in which he exhibited the *secale cornutum* with (he says) decided advantage: its action, according to him, being *hypothenic*, and not stimulant, as is generally imagined.—(*Rev.*)

MESMERISM.

We do not know whether to congratulate, or condole with, the talented Heroine of Political Economy on the strange dream that has come over her soul. It appears that Miss Martineau recovered her health and—we were nearly saying—lost her senses! But this is not the case—she has acquired an additional sense—CLAIRVOYANCE! Her maid, BETTY, placed her hand on her mistress's ivory forehead, and, presto, a STEAM-TUG that was passing, became metamorphozed into a ship of celestial glory, fringed with gold and silver, and fit to be "a God-head's dwelling."

It's all in my eye, BETTY MARTIN—EAU!

Betty, however, is no fool. She prescribed ale and brandy and water to her mistress, instead of opium-eating, and the change resulted in the best effects. Harriet's Mesmeric dreams will prove a god-send to the animal magnetizers, and will command more attention among the old women of both sexes than her Political Economy and her "Preventive Checks." But it won't do!

It will be the wonder of the day—perhaps of nine days—and then sink into oblivion with the exploits of Miss Okey.

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MEDICAL REFORM.

PERISCOPE.

Spirit of the Foreign Periodicals, &c.

THE

MEDICO-CHIRURGICAL

REVIEW.

APRIL, 1845.

I. TRAITÉ DES PHÉNOMÈNES ELECTRO-PHYSIOLOGIQUES DES ANIMAUX. Par *C. Matteucci.* Suivi d'ETUDES ANATOMIQUES SUR LE SYSTÈME NERVEUX ET SUR L'ORGANE ELECTRIQUE DE LA TORPILLE. Par *Paul Savi.* Paris, 1844. Octavo, pp. 348. Plates.

A Treatise upon the Electro-physiological Phenomena of Animals. By *C. Matteucci.* To which are added, Anatomical Investigations respecting the Nervous System, and the Electric Organ of the Torpedo. By *Paul Savi.*

II. RAPPORT ENTRE LE SENS DU COURANT ELECTRIQUE ET LES CONTRACTIONS MUSCULAIRES DUES A CE COURANT. Par MM. *Longet* et *Ch. Matteucci.* (Comptes Rendus de l'Académie des Sciences, du 9 Septembre, 1844.)

On the Connexion between the Direction of the Electric Current and the Muscular Contractions excited by that Current. By MM. *Longet* and *Ch. Matteucci.*

FEW subjects present more interesting topics of inquiry to the physiologist, than the connexion between the vital and inorganic forces. For nearly half a century physiological writers have thrown out sundry vague suggestions or opinions of the possibility or even probability of the existence of some mysterious connexion between electricity and vitality. Of the precise nature of that connexion they themselves had no definite idea, and, therefore, were unable to express themselves otherwise than in general, vague, and often in unmeaning terms. Abernethy, who adopted Hunter's opinion, that there is a principle of life independent of organization—a something superadded to organized structure—boldly stated his belief that the vital principle was either electricity or something of a similar nature. On this view, then, it is assumed, that every vital process in the animal body, nay, in the vegetable also, is attributable to electric action;—an extravagant assumption hitherto unsupported by facts.

With some few exceptions, later writers have been content to take a more limited view of the connexion between electricity and the animal functions, and have ascribed some only of the vital processes to electrical agency. Secretion and nervous action have formed the most favourite processes for explanation by electro-physiological hypotheses. The resolution of neutral salts into their acid and basic constituents by electricity led Dr. Wollaston, about thirty-six years since, to throw out the suggestion that possibly the products of secretion might be owing to electricity of low tension. The actual existence of certain analogies between electricity and the active principle of the nerves, and the supposed existence of others, have induced many physiologists to regard the nervous cords as electrical conductors, and nervous action as identical with electrical action. To test the accuracy of this hypothesis, endeavours have been from time to time made to detect electric currents in the nerves, but in no instance with satisfactory results. In some cases, indeed, these attempts have been reported as successful; but, when the experiments have been repeated by those most competent to make them, and with the requisite precautions to guard against all known sources of fallacy, the result has hitherto, in every instance, been a failure; and we believe that, up to the present time, there are no well-grounded facts on which we can venture to assert the existence of an electric current in the nerves; or to contend for the identity of nervous and electric action. Indeed, as a recent able physiological writer (Müller) has justly observed, though we may be able to generate electric action in the nerves, yet the mode of action of the nerves is wholly different from that of electricity.

Matteucci has been, for several years, favourably known to the scientific world by his researches in Electro-physiology. Those of his investigations which form the subject of the present notice, and which are contained in the book and paper whose titles are placed at the head of this article, are of a highly interesting nature. They derive additional importance from the fact, that the Council of the Royal Society, on the recommendation of its Committee of Physics (which includes Messrs. Faraday, Daniell, Wheatstone, and other distinguished electricians) has recently adjudged the Copley Medal to Matteucci, for his novel, ingenious, and important electro-physiological discoveries. During the last Autumn, Matteucci came to this country to attend the meeting of the British Association, and demonstrated the most important of his results, on the electricity of animals, to a considerable number of persons, both in London and elsewhere. The dexterity and facility with which he conducted his experiments, the very marked and satisfactory results which he obtained, and the numerous precautions which he employed to guard against fallacies, cannot be too highly praised. Every one who witnessed his demonstrations felt satisfied as to the reality and constancy of the effects which he saw, and the experiments have since been repeated by others (including ourselves) with the most satisfactory results.

In our personal communications with Matteucci, as well as in the perusal of his writings, we have been struck and delighted with the remarkable candour and caution which he has everywhere exhibited. He seems to have no desire to ascribe to his subject more importance than it really deserves; no wish to give the power of which he treats a more general or universal

agency than it actually possesses. Instead of regarding the vital functions as resulting from electrical action, as some previous writers have done, he reverses the picture, and shows us that the electrical currents, which he has detected in the animal body, are not the causes, but the effects, of the changes going on in the living machine. He repudiates the idea of the identity of the nervous force with the electricity. He tells us that he has in vain sought for an electric current in the nerves, and, further, that the properties and laws of the propagation of electricity are incompatible with the idea of such a current.

In noticing Matteucci's works, we do not think it necessary to examine all the subjects which he has investigated, or to follow the precise order which he has done, in placing before our readers what we conceive to be the more novel and important, and, therefore, the most interesting, of the results which he has obtained.

1. In the *Historical Introduction* to his work, Matteucci corrects several popular errors which are prevalent with respect to the discovery of Galvanism. He informs us, on the authority of Duméril, that Swammerdam, in his *Biblia Naturæ*, vol. ii., p. 849, is the earliest writer who is known to have observed contractions excited in the muscles of an animal by a voltaic combination. The precise form of the apparatus which was used is not, however, very clearly described; but it consisted of silver and copper. The experiment is, in fact, essentially the same as one subsequently made by Galvani; who does not, however, appear to have been acquainted with that made by Swammerdam, notwithstanding that it was performed before the Grand Duke of Tuscany.

Our readers will, no doubt, be surprised to find that the story told, in almost every treatise on Electricity, of the accidental discovery of Galvanism is incorrect. Alibert, in his *Eloge* on Galvani, contained in the 4th volume of the *Memoires de la Société Médicale d'Emulation*, and Chaumeton, in the *Biographie Universelle*, give very interesting details respecting the accidental observation by Madame Galvani, of the convulsions excited in frogs (prepared for her dietetical use), by the electrical spark. These details, it appears, are fabulous, for Matteucci states that—

"The Institute of Bologna possesses some unexceptionable documents which fix the period at which Galvani commenced his first experiments on the frog. In the register signed by the celebrated Canterzani, Secretary to the Academy, are the following notes relative to the dates of the memoirs which Galvani had communicated :—

April 9th, 1772. *On Hallerian Irritability.*
April 20th, 1773. *On the Muscular Movements of Frogs.*
Jan. 20th, 1774. *On the Action of Opium on the Nerves of Frogs.*

So that twenty-one years before the publication of the celebrated commentary, *De Viribus Electricitatibus*, and made in 1791, Galvani had commenced his experiments on the contractions of frogs: and notwithstanding that he was most completely devoted to his wife, we must not believe what Alibert states in his *Eloge*, viz., that the frogs, in which Galvani saw the first contractions produced by electric action, had been accidentally placed on the table by the side of the electric machine, and were intended to be employed in the preparation of soup for his Lucy. Among the manuscripts of Galvani has also been found the

journal in which is contained a description of his first experiments on the contractions excited in frogs by what he calls artificial electricity. It is dated November 6th, 1780—that is, eleven years before the publication of his Commentary—and in his first experiment he writes, '*The frog was prepared in the usual manner*,' (*alla solita maniera.*) Evidently, therefore, it was not the first time that he had made experiments on frogs." 6.

A. We must content ourselves with one more extract from the historical part of Matteucci's *Traité,* and then proceed to other topics.

"The first phenomenon which Galvani describes in his Commentary is that which has been criticised by all historians, and which, according to them, proves that *he was entirely ignorant of the true theory of electrical influences.* We know that Galvani observed the contraction of a frog prepared in the ordinary way, *de more parata,* every time that, being in communication with the floor, by a conducting substance, a spark was drawn from the conductor of the machine, more or less near to which was the frog.

"Nothing can be more unjust than this criticism. Galvani was surprised at the effect described, and so would have been, at that period, any philosopher. Galvani studied the phenomenon with every care and the greatest sagacity. Moreover, in a Latin memoir, which is very little known, and in which he treats of the electrical light observed in air more or less rarefied, it is easy to perceive that Galvani was quite up to all the discoveries and theories of electricity of that period. In his memoir, *On the Employment and Activity of the Conducting Arc,* he says that the contraction of the frog may be very well explained, in the case abovementioned, by the returning stroke (*le coup de retour.*) So that he explained the phenomenon as we now do.

"In pursuing his researches, Galvani submitted the prepared frog to the passage of atmospheric electricity; and it was in performing these experiments that he discovered that the frog was the most delicate of all electroscopes. We cannot read, without shuddering, the details of an experiment described in his journal, and made on the 7th of April, 1786. Galvani held in his hands the insulated atmospheric conductor at the instant of the occurrence of a loud clap of thunder: the experiment of the metallic arc was yet to be made!" 7.

B. We much regret that our space does not permit us to enter into further details respecting Galvani's discoveries and theories; which never appear to us to have been appreciated as they have deserved, and which were eclipsed by the subsequent splendid discoveries of Volta. To Matteucci is due the credit of re-directing public attention to them. After reading his work we rose with a much augmented veneration for the genius, the industry, and the sagacity of Galvani; and we look forward with much interest to the appearance of the entire works of Galvani, which are preparing for publication under the auspices of the Academy of Sciences of Bologna.

2. *Instruments employed in Electro-physiological Researches.*—Matteucci describes five instruments which are employed in experiments on electrical physiology. They are as follows: 1st. *Nobili's Galvanometer with the Astatic Needle.* [A figure and description of this instrument are contained in the second volume (p. 504) of Lardner and Walker's *Manual of Electricity,* (Lardner's Cyclopædia.] *Rumkorf's Condenser* (composed of a pair of box magnets) has been contrived to augment the sensibility of the galvanometer. 2ndly. *The Frog Galvanoscope,* which will be described presently. 3rdly. *The Electroscope,* (with or without Volta's condenser,) for detecting tension electricity. 4thly. *A Constant Battery,* composed of

plates of copper and of amalgamated zinc. The copper plate is immersed in a solution of sulphate of copper; while the zinc plate is excited by a solution of common salt or by water acidulated with sulphuric acid. 5thly. *A Tangential Needle,* (boussole de tangente) to ascertain the constancy of the current obtained by the pile.

The *Frog Galvanoscope* is an important and useful instrument in electro-physiological researches. As we shall hereafter have occasion to refer to it, we take this opportunity of describing it. The preparation called by Matteucci "*the frog prepared according to Galvani's method,*" (la grenouille preparée à la manière de Galvani,) consists of the skinned hind extremities of a vivacious frog, attached to a small portion of the spine by the sciatic or lumbar nerves only. The *frog galvanoscope* (grenouille galvanoscopique) on the other hand, consists of one skinned hind extremity of the frog, to which is attached a long nervous filament (the sciatic nerve). The limb is introduced into a glass tube, from out of which the nerve is allowed to be pendent.

"To employ this galvanoscope we take hold of the tube by the opposite extremity to that containing the frog's limb, and cause the nerve, which projects from the tube, to touch two points of the electro-motor element which we wish to examine. If the nervous filament be traversed by an electric current, the leg instantly contracts. If it be suspected that the direct contact of the nerve with the points of the electro-motor element might irritate the nerve, independently of the electric current, the suspicion may be readily obviated by placing two pieces of paper moistened with water on the two points of the electro-motor element, and afterwards closing the circuit by touching the two papers with the nervous filament.

"The frog used in this way, which I shall hereafter call the *frog galvanoscope,* is undoubtedly the most sensible apparatus we possess, if we renew it from time to time. The same instrument is also very accurate in its indications, if the nerve have been carefully dissected out so as to leave no matter adherent to it, and if the circuit be closed by the nerve only; no portion of the muscle of the leg being comprehended in it. The frog galvanoscope indicates to us not only the existence of an electric current, but also, with a very high degree of probability, the direction of the current. When the frog is somewhat weakened, we almost constantly see the leg contract when the circuit is closed, and remain unmoved when the circuit is opened, provided the current is in the direction from the nerve to the leg. If the phenomena occur in an inverse order, it arises from the current passing in the opposite direction, that is, from the leg to the nerve. We have then only to close the circuit with the nerve, and to open it the instant after, to determine at which of the two times contraction takes place. And to confirm the indication of the first experiment, we should reverse the position of the nerve; and if the first result were accurate, we shall now find that the limb will contract at the time when, in the first experiment, it was unmoved; and will remain tranquil at the period when before it was contracted." 30.

3. *Of the Electric Current in the Muscles of Living or recently Killed Animals.*—We have now to notice what we conceive to be the most interesting and important part of Matteucci's work; viz., that which treats of the electric current which exists in the muscles of animals both during life and for a certain period after death.

But before we proceed to notice his statements on this point, we think it due to the memory of Galvani to observe, that the existence of the muscular current seems to have been first recognised by this celebrated

Bolognian professor. It is well known that he believed in the existence of an *animal electricity*, the principal reservoirs of which were the muscles. The nerves he considered to be conductors; as serving to convey the electricity from the interior to the surface of the muscle. The apparent homogeneity of muscular tissue did not divert him from his hypothesis, for he found something analogous, something to support his opinion in the tourmaline.

But to return to Matteucci:—

"There is a very simple and very easily-made experiment," says he, "which proves the existence of an electric current developed by connecting, by means of a conducting substance, the different points of a muscular mass belonging to a living or recently-killed animal. We use for this purpose the *frog galvanoscope;* the nerve of which is to be introduced into a wound made by cutting the muscle of a living animal. By proceeding in this way it often happens that the frog is convulsed. But if we conduct the experiment carefully, we readily perceive that in order to be successful we must touch, with two different parts of the nervous filament, two different points of the muscular mass. Thus by touching, with the extremity of the nerve of the frog galvanoscope, the bottom of the wound, and with another part of the same filament the edge of the wound, or the surface of the muscle, the frog is instantly convulsed. This evidently proves that an electric current really circulates in the nerve, inasmuch as (to obtain the effect) we must *form* an arc in which this same nerve is comprised. That this contraction of the frog can be excited by an electric current due to the different points of the muscle of the living animal, is likewise clearly proved when we consider that, whatever be the liquid or conducting body with which the two parts of the nerve are touched, contractions are never excited." 52.

We may here observe that when an electric current is made to traverse a nerve centrifugally, that is, in the direction from the brain towards the distal extremities of the nerve, it is called a *direct* current; but when in the opposite direction or centripetally, it is termed an *inverse* current (p. 197.)

In every case contraction of the frog galvanometer is induced when the outer and inner surface of a muscle is connected by the nerve of the frog's leg. The experiment succeeds in fishes, reptiles, birds, and mammals; but the intensity of the current varies in different animals. The muscles of cold-blooded animals continue for several hours to give signs of the current.

If the *galvanometer* be substituted for the frog galvanoscope, deflection of the needle is obtained: thus satisfactorily proving that there is an actual electric current developed in the muscle, and that the effect on the frog galvanoscope is not due to any other cause. Moreover, this current exists in living, as well as in recently-killed, animals, when the circuit is closed between the interior and surface of a muscle. We think it unnecessary to describe all the precautions used by Matteucci to avoid various sources of fallacy; but we may observe that he has, in our opinion, satisfactorily proved that the current is not due to differences in the chemical nature of the fluids or to other adventitious circumstances; but really is a true muscular current. The direction of the current is, in every case, from the interior to the surface of the muscle; or, to speak more generally, from the interior of a muscle to any conducting body whatever which communicates with the surface of the muscle. Or we may say that the

interior of the muscle is negative to the surface of the muscle; or that the surface of the muscle is positive to the interior.

By using a series of portions of muscles cut from recently-killed animals we form a *pile* or *battery*. In this way we may obtain a *frog battery*, an *eel battery*, a *pigeon battery*, &c.

To make a *frog battery* we take a number of skinned hind extremities of frogs. We cut off the legs at the knee-joint, carefully avoiding to injure the muscles of the thigh. Then divide the thighs transversely at about their middle. In this way we obtain conical-shaped pieces or half thighs.—These are to be placed on an insulating tray (varnished wood) in which are two small saucer-shaped depressions or hollows capable of holding one or two drachms of water. These we shall call water-cups. A row or series of half-thighs is now formed on the tray, in such a way that the outer portion of each muscular mass (that is, the knee-end or smaller extremity of the half-thigh) shall be opposed to, and in contact with, the internal surface of the muscular mass (the cut surface of the half-thighs.) One end of the row is in communication with one water-cup, the other end, with the other water-cup. Thus these cups, or rather the water which they contain, become the working poles of the battery, and they may be connected with the frog galvanoscope or the galvanometer, by means of platinum wire or moistened paper. A pile of twelve or fourteen pieces, or even less than this number, produces very marked and distinct effects on the galvanometer. In this pile the current passes from the exterior of one half-thigh to the interior of the second one, and from this to the surface of the same one, and thus to the interior of the third, and so on.

An *eel battery* is made with sections of the tail-end of the animal so disposed that the surface of one piece is in contact with the internal portion of the second piece, and so on for the whole series.

A *pigeon battery* is formed with slices of the pectoral muscles placed so that the outside of one slice is opposed to the inside of the next slice, and so on. A series of eight slices produces very distinct effects.

From a very elaborate series of experiments, which our space does not permit us to describe, Matteucci has drawn the following inference:—

"1st. That the intensity of the muscular electric current varies, in cold-blooded animals, proportionately to the temperature of the medium in which they have lived during a certain period.

"2ndly. That the duration of the current after death is shorter in proportion as the animal is more elevated in the scale of beings.

"3rdly. That the intensity of the muscular current varies with the degree of nutrition of the muscle, being greatest in muscles which are engorged with blood or which are inflamed.

"4thly. That this current is altogether independent of the integrity of the motor and sensorial nervous system, and of the activity of this system.

"5thly. That the influence of narcotic poisons on this current is either nothing or very feeble.

"6thly. That of different gaseous poisons, sulphuretted hydrogen is the only one which diminishes, in a remarkable manner, the intensity of the muscular current.

"7thly. That the direction of the muscular current is the same in all cases." 83.

What is the probable origin of the muscular current which is thus in-

dubitably proved to exist? The experiments which we have detailed, neither prove the existence of free electricity in living animals, nor that electricity circulates in the nervous filaments. Matteucci has detected a current in muscular masses, without the integrity of the nervous system; and even when this system, on being irritated, ceased to produce contractions. The electric current appears whenever the circuit is completed between the outer and inner part of the muscles; and it is probable, therefore, that the structure and functions of these two parts differ.

As the signs of the current cease after a certain interval (which is greater in the inferior animals) subsequent to death, we may fairly conclude—

"That the organic disposition which constitutes the living muscular fibre, is as necessary as the action, whatever it may be, which maintains it in that state.—This is furthermore confirmed by the influence exercised on the muscular current by the circulation of blood, by the redness of the muscular masses, by their condition of inflammation, &c." 124.

It is natural then to suppose that the nutrition of muscles and of other parts develops electricity. We know that the oxygen of arterial blood influences every part of the animal economy, that every part of the organism is incessantly undergoing a process of renewal, and that in every part this renewal is attended with a process analogous to combustion, by which carbonic acid is developed and heat extricated.

Matteucci compares the process by which the muscular current is generated to an ordinary voltaic apparatus. The oxidable element (*e. g.* the zinc) represents the fibre of the muscle; the acidulous liquid used to excite a voltaic apparatus is represented in the animal, by the arterial blood; and, lastly, the non-oxidable element (*e. g.* the platinum or copper) is the analogue of the surface of the muscle, or of any other conductor not consisting of muscular fibre.

To explain more clearly Matteucci's hypothesis, we have drawn up the following diagram, denoting by the arrows, the direction which in each case the current follows :—

↓			↓
	Oxidable element (zinc) represents the	Fibre of the muscle.	
	Acidulated liquid	Arterial blood.	
	Non-oxidable element (platinum) .	Surface of the muscle.	

The nervous system may act, in the production of the muscular current, in two ways: 1st, as an imperfect conductor, which constitutes part of the circuit, and which is not the source of the electricity. This first function is entirely physical. 2ndly. It may also act by maintaining the cause which disengages the electricity; for nutrition is effected under the influence of this system. But as by cutting a nerve we cannot instantly arrest the chemical action attendant on nutrition, which is going on in the part supplied by the nerve, so division of the nerve is not immediately followed by a cessation of the muscular current.

We have thus endeavoured to give, as concisely as we could, Matteucci's hypothesis of the origin of the muscular current, and we proceed now to another topic.

4. *Of the Electric Current peculiar to the Frog.*—Besides the muscular current, another electrical current has been detected in the frog; and as

Matteucci has hitherto failed to recognise it in any other animal, he calls it the "*Courant propre de la Grenouille*," or, as we have rendered it, the "*Current peculiar to the Frog.*" Its direction is invariably from the feet towards the head of the animal. Some of the phenomena dependent on it were successively recognised by Galvani, Humboldt, Valli, and Nobili.

"Nobili prepared the frog according to Galvani's method [which we have already described.] The preparation was then placed in such a position, that while the lumbar nerves were immersed in water in one cup, the legs were contained in the water of another cup. By plunging the two plates of the galvanometer into the water of these cups the circuit was closed. * * * * * * In this way Nobili obtained a deflection of the needle, to the extent of 5°, 10°, 15°, or more degrees. * * * * * * If the frog be robust, and have been quickly prepared, we see, at the moment of closing the circuit with the galvanometer, the limbs contract." 84.

A *battery* or *pile* may be formed by arranging a series of these preparations, the feet of one frog being in contact with the lumbar nerves of the next, and so on. Or we may compose a pile, resembling Volta's *couronne des tasses*, with a series of cups, as above described. However formed, the direction of the current is constant, namely, in each frog, from the legs to the nerve, or rather from the feet towards the head.

The phenomena dependent on this current may be produced in a great variety of ways, for a description of which we must refer our readers to Matteucci's work. The current itself may be detected in three ways; by the galvanometer, (as above described,) by the frog galvanoscope, and by the contractions of the limbs of the preparation itself. Matteucci thus describes this last mode of proceeding:—

"I remove the skin from the legs of the living frog, and cut the preparation longitudinally in the pelvic region, so as to expose the lumbar nerves. Then, by bending the legs we can bring them in contact with the lumbar nerves, and at that instant the contractions are observed." 87.

Matteucci has sought in vain for this current in other animals, although he has never failed to detect in them the muscular current. In salamanders, eels, and tortoises, he could find no current analogous to that found in the frog. He has, therefore, assumed that it is peculiar to this animal, and hence the name, which he has given it, of "*Courant propre de la Grenouille.*"

But against such an assumption we beg to enter our protest; because it is in opposition to every thing which we at present know respecting the organization and physiological relations of animals. It is with great diffidence that we venture to differ from Matteucci on any point of electro-physiology; but we cannot for a moment admit the probability of the frog possessing a peculiar electric current, unendowed as this animal is with any peculiar organs or electric apparatus. And on what grounds, it may be asked, is such an assumption made? Merely on negative evidence. Hitherto the author has not succeeded in detecting an analogous current in other animals, and he has, therefore, concluded (too hastily in our opinion) that it is peculiar, or proper, to the frog. We, on the other hand, confidently believe that, whatever currents may be detected in the frog, the same will be found to exist, in some degree of intensity, in other animals.

What is the origin of the *courant propre?* On this point nothing satisfactory is known. Some have regarded it as a *thermo-electric* current, dependent on the unequal temperature of the muscle and nerve, and arising from differences of evaporation. Others have considered it as an *electro-chemical* current; the leg being assumed to be charged with an alkali or with salts, and the thigh or lumbar nerve with some acid or other saline solution. Both these hypotheses Matteucci very properly rejects as untenable; and he observes that, if we refer the "courant propre" to the same origin as that assigned for the muscular current, it is necessary to assume that the tendinous surface which composes the greater part of the frog's leg represents the interior of the muscle.

5. *Of a Physiological Phenomenon produced by a Muscle in Contraction.*—The phenomenon which Matteucci has treated of under the above title is a novel and highly curious one, which might be more expressively termed an instance of "electric sympathy." If the muscles of a frog prepared according to Galvani's method, or of a rabbit's thigh, be made to contract (by a current of electricity transmitted through the nerves or by any other method,) a series of frogs' legs may be made to contract simultaneously, (by sympathy, it would almost appear) provided the protruding nerves of each of the legs be laid across the muscles of the thigh of the rabbit or the first frog. The sympathetic movements do not occur if either a thin insulating plate, or a piece of gold-leaf be interposed between the contracting muscles and the nerves of the other legs.

Becquerel thinks these facts can only be explained by admitting that when a muscle contracts an electric discharge occurs; and that the electricity traversing the nerve of the frog's leg, occasions this also to contract. But if the electric current be prevented from entering the nerve, either by an interposed insulating plate, or by a better conductor, as gold-leaf, which conveys the current in another direction, the sympathetic contraction does not then take place. Perhaps the electric discharge is the muscular current whose intensity may become augmented by the contraction of the muscle.

6. *Of the Effects of the Electric Current on the Nerves.*—(A.) *On the Motor and Mixed Nerves.*—The effects of an electric current on the nerves vary at different periods after the death of the animal. Nobili fancied that he could distinguish five stages in the vitality of the nerve; but Matteucci admits only two. In the first of these, muscular contractions are produced, both at the commencement and at the interruption or cessation of the current: but in the second period they are observed in one case only, viz., either at the commencement or at the interruption of the current. In the case of the *mixed* nerves, (by which we mean nerves which are both sensitive and motor, and which, therefore, have double roots,) the contractions are observed *at the commencement of the direct current, and at the cessation of the inverse current.* But, with the *motor* nerves, the phenomena are reversed; for the contractions only occur *at the commencement of the inverse current, and at the interruption of the direct current.*

"The anterior spinal root," observe MM. Longet and Matteucci, "has been

subjected to both *direct and inverse* galvanic currents in the four following conditions: 1st, the anterior and corresponding posterior root being untouched; 2ndly, both being divided; 3rdly, the posterior being untouched, the anterior divided; 4thly, the posterior being divided, the anterior being untouched.

"In every case, the contractions of the muscle or muscles animated by the anterior root on which the experiment was made, were manifested at first confusedly both at the commencement and at the cessation of the current, whatever its direction might be; but, after a certain interval, (which was somewhat longer when the anterior root was adherent to the medulla,) the effects became evident and durable; the contractions took place only *at the commencement of the inverse current, and at the interruption of the direct current.*"

Now we beg the especial attention of our readers to these curious results; which, to render more intelligible, we have thrown into a tabular form:—

		Effects on	
		Motor Nerves.	*Mixed Nerves.*
Direct or centrifugal current	Commencement . . .	no effect.	Contraction.
	Interruption	contraction.	No effect.
Inverse or centripetal current	Commencement . . .	contraction.	No effect.
	Interruption	no effect.	Contraction.

A slight inspection of this table shows that the effects produced by the commencement of the direct current are identical with those caused by the interruption of the inverse current; and, *vice versâ*, those which the interruption of the direct current gives rise to, are identical with such as result from the commencement of the inverse current.

Not the least curious part of these phenomena is the opposition which appears to exist between the direction of the current and the direction of the action of the motor nerve. The latter is centrifugal, the former centripetal. The motor influence is propagated along the motor nerve in a centrifugal direction only; that is, in a direction from the nervous centres towards the distal extremities of the nerve. But in order to make manifest this influence by an electric current, we are obliged to cause this to traverse the nerve centripetally, that is, in a direction from the distal extremities of the nerve towards the nervous centres.

These facts appear to us to establish a great similarity between the effects of electric currents on the nerves, and those of *volta-electric induction* discovered by Mr. Faraday. It is well known that an electric current will induce another electric current in a neighbouring conductor; but the secondary or induced current takes place only at the moment of making or breaking the voltaic current. In the first case (that of making the circuit) the direction of the induced current is *opposite* to that of the primary or inducing circuit; while, in the latter case (that of breaking the circuit,) the direction of the induced and inducing currents is the *same*. The secondary or induced current is only momentary. It does not exist during the continuance of the contact, but only at the moment of either making or breaking it.

If we were to assume that the physiological effect (*i. e.* the muscular contraction) was the immediate effect of a secondary or induced current, and not of the primary or inducing one, we should then find that the

direction of the current and the direction of the action of the motor nerve would be identical; that is, both would be centrifugal.

We shall again resort to a table to illustrate our meaning.

		Characters of the Secondary or Induced Current.	*Effect on a Motor Nerve.*
1. Direct or centrifugal Current induces	On making contact	an inverse or centripetal current	none.
	During contact	none	none.
	On breaking contact	a direct or centrifugal current.	muscular contract.
2. Inverse or centripetal Current induces	On making contact	a direct or centrifugal current	muscular contract.
	During contact	none	none.
	On breaking contact	an inverse or centripetal current	none.

On this assumption we can easily account for a fact before stated, namely, that the effects produced by the commencement of the direct current are identical with those caused by the interruption of the inverse current, and *vice versâ*. Moreover, this assumption agrees with another fact, namely, that during the closure of the circuit or continuance of the contact, no contractions are produced; for, as will be seen by reference to the foregoing table, no secondary current exists at this period.

But if the muscular contractions, which result from the commencement or interruption of an electric current through the nerve, be due to a secondary or induced current, what structures, it may be asked, do the primary and secondary currents respectively traverse? To this question we are unable to give any definite reply. But, for the purpose of illustrating our position, let us assume that the primary current traverses the nerve coats, the secondary one, the primitive nervous fibres; and we shall then have the requisite conditions.

The complete opposition of effect produced by the electric current on motor and mixed nerves, led MM. Longet and Matteucci to repeat their experiments on various animals; namely, on the horse, the dog, the rabbit, and the frog. The results, however, were constant and invariable.

"But to produce them with success in the frog, it is indispensable (on account of the shortness of the roots, and of the extreme facility with which galvanic excitation is transmitted beyond the intervertebral ganglion, and, consequently, to the mixed spinal nerve) to take certain precautions which, although very simple, were only discovered by us after repeated experiments. After having separated the medulla from the encephalon, and opened the spinal canal from the abdomen, we insinuate pieces of varnished taffeta beneath the anterior lumbar roots, which are left adherent to a sufficient length of the spinal marrow. Then, having cut all the lumbar nerves of the opposite side, we apply the extremity of one reophorus (*pole*) on the anterior part of the medulla, and the extremity of the other on the anterior root. In this case the effects are soon manifested in as marked a manner as in the dog, that is to say, the contractions of the abdominal member are observed in two cases only; at the commencement of the inverse, and at the interruption of the direct current. But if, applying

the two reophori (*poles*) on the anterior root itself, we approach the intervertebral ganglion, and the excitation be thereby transmitted to the mixed nerve situated immediately beneath this ganglion, the phenomena will seem to be reversed, and to appear to be such as occur with nerves which have not, as the anterior roots, an exclusively centrifugal action. It is a fact worthy of notice, that by continuing to pass a current through the divided anterior roots (of the horse, dog, &c.,) the muscular contractions, excited by the commencement of the inverse current, continue for a much longer time than those produced by the cessation of the direct current."

Mode of distinguishing the Motor and Mixed Nerves.—The experiments which have been devised and practised for ascertaining the functions of the nerves are the most cruel that can be imagined; while the results thereby obtained, have frequently been unconvincing or uncertain. Every friend of humanity, therefore, will rejoice to find that in electricity we have an agent capable of distinguishing the motor and mixed nerves after the death of the animal. Alluding to the different and remarkable action of electric currents on nerves, either exclusively motor, or both motor and sensitive, MM. Longet and Matteucci observe that this appears to them "to constitute a sure means of distinguishing these nerves from each other, and may consequently serve to elucidate a question which has hitherto divided physiologists, namely, whether or not there are any nerves which are mixed at their origin."

(B.) *Effect of the Electric Current on Sensitive Nerves.*—MM. Longet and Matteucci, in another part of their memoir, describe the effect of electricity on the posterior or sensitive roots of the spinal cord. When these were separated from the cord no contractions were excited by the electrical current whatever be its direction.

"But when they were still adherent to the medulla, they *always* gave rise to convulsive shocks *on closing the circuit*, whether the current was inverse or direct. It was evident, however, that these convulsions were entirely due to a reflex action on the anterior roots; for when the latter were cut across, all contraction instantly ceased."

New proof of the Functions of the Anterior Columns of the Spinal Cord.—Another interesting point, which the researches of MM. Longet and Matteucci have elucidated, is the function of the anterior columns of the spinal cord, which are shewn to possess an exclusively motor function; a fact which had been ascertained by physiologists by other modes of investigation; but which is thus singularly confirmed by the influence of electrical currents.

"Our experiment on the anterior white fasciculi of the spinal marrow, made on dogs, rabbits, frogs, and the common ringed snake (*Coluber Natrix*), have demonstrated that these fasciculi are affected by the *direct* and *inverse* currents in the manner of the anterior roots; a new proof of the exclusively motor function of the anterior white part of the cord."

The posterior Columns of the Cord are entirely devoid of a Motor Function.—MM. Longet and Matteucci's experiments confirm the common opinion of physiologists that, while the anterior columns of the cord are exclusively motor, the posterior columns are exclusively sensitive. For

they found that, when all *reflex action* in the caudal extremity of the divided medulla of a dog had disappeared, "the (electric) stimulation of the posterior fasciculi never gave rise to the least muscular contraction, whatever was the direction of the current."

So that Bellingeri's groundless assumption of the motor function of all the white substance of the cord (the anterior columns being supposed to supply the flexor,—the posterior columns the extensor muscles) is thus satisfactorily disproved.

Function of the Grey Substance of the Spinal Cord.—With regard to the function of the internal grey portion of the spinal cord, MM. Longet and Matteucci observe that,—

"Some German physiologists having recently regarded the grey matter of the spinal cord as indispensable to the transmission of impressions and of the principle of voluntary movements, we think it proper to state that, in the dog, we have constantly found it insensible and inapt for producing convulsive shocks, under the influence of electricity and of mechanical irritants; and that its destruction, for as great a length as possible, by the aid of a stiletto, did not in the least modify the sensibility of the posterior medullary fasciculi or the excitability of the anterior ones."

(C.) *Conducting Power of the Nerves, &c.*—Matteucci infers, from experiments expressly made to determine the conducting power of different parts of animals, that "the conducting power of muscle may be assumed to be four times greater than that of the cerebral and nervous substances, which do not sensibly differ from each other in this respect." But he afterwards states that in most of his experiments, the nerve appeared to conduct somewhat better than the cerebral substance.

(D.) *Circumstances which modify the Action of the Electric Current on the Nerves.*—Matteucci notices three, viz., Voltain alternatives, ligature of nerve, and poisons.

α Of the Voltain Alternatives.—The discovery of the modification of the action of the electric current on the nerves, by the passage of the current itself through the nerves, was made by Volta.

"The current which traverses a motor nerve of a living or recently-killed animal, and which continues to pass in the nerve during a certain period, modifies the excitability so as to render the nerve insensible to the passage of the current, so long as it moves in the same direction. But the excitability of the nerve re-appears when the current is made to pass in the opposite direction. * * * * * * * So that every change in the direction of the current, the limb, which previously contracted only when we close the circuit, becomes now capable of contracting at the interruption of the same circuit."

Matteucci found that the direct current destroyed the excitability of the nerve much more speedily than the inverse current. It also appears that a continued current less speedily exhausts the excitability of the nerve than a current alternately interrupted and renewed at very short intervals of time.

β. Ligature of the Nerve.—A ligature, it is well known, interrupts the passage of the nervous influence : how does it affect the electric current? It is commonly believed, even by some of the best writers on physiology, that the ligature of the nerve does not prevent the action of an electric current acting above the ligature. Matteucci, however, has shown this opinion to be erroneous; for, when complete insulation is adopted, the ligature of the nerve as completely interrupts the action of electricity as of any other stimulant.

γ. Poisons.—On this point Matteucci observes that he has found, "that *carbonic acid gas*, *nitrogen*, and *chlorine* do not weaken the excitability of the nerve submitted to the electric current; and the same may be said of *sulphuretted hydrogen*. One of the poisons which has the greatest power of enfeebling the excitability of the nerve is *hydrocyanic acid*."

But if, when the nerves of a frog (poisoned by the latter substance) are no longer susceptible of the influence of a current transmitted through them, we pass the current through the muscles, contractions again appear, which, therefore, must be due to the action of the current on the muscles themselves. Death by an electric discharge destroys almost entirely the excitability of the nerve submitted to the electric current; but the muscles of frogs, which have been thus killed, retain their irritability; since the electric current again excites their contraction. In poisoning by solutions of extract of *opium* or of *nux vomica*, three stages or periods are distinguishable. In the *first*, the animal is in a state of super-excitation, and the feeblest contraction is sufficient to agitate the entire animal. In this stage, the nerve is very excitable, and the current produces contractions, both at its commencement and cessation. In the *second* stage, tetanic convulsions are produced. If a frog, in this tetanic state, be submitted to the action of electricity, we perceive a slight shock at the commencement of the current; but after the circuit is closed, the tension of the muscles ceases, and relaxation takes place. Matteucci has observed a difference between the action of the direct current and that of the inverse one : the current directed from the feet to the head excites at the commencement a shock, which is weaker than that produced at the commencement of the direct current. In the *third*, or last stage, all tetanic movements have ceased; and then there is either no excitability of the nerve, or scarcely any; but the muscular fibre still retains its power of contraction when submitted to the electric current.

7. *Therapeutical Uses of the Electrical Current.*—We have now arrived at the last division of our subject, that which relates to the medicinal employment of electricity. Hitherto practitioners have, for the most part, prescribed this agent in certain diseases, as a last resource, when other remedies, in which more confidence is very properly placed, have failed. It is employed empirically: no very satisfactory principles, for the guidance of those who use it, having been ascertained. Let us see then, what are the practical conclusions which may be fairly drawn from Matteucci's electro-physiological researches.

In the first place, what are the diseases for the relief of which electricity deserves to be tried? Matteucci's researches lead him to be-

lieve that *paralysis*, either partial or total, of motion, of sensibility, or of both these functions, are the maladies for the alleviation of which the electric current deserves to be tried. He has also proposed it in *tetanus*. As to its employment *for the purpose of destroying the opacity of the crystalline lens*, as lately proposed, Matteucci candidly states that he thinks it is more calculated to make a cataract than to cure one. Nor does he think it probable that *urinary calculi* can be got rid of by electrolysis.

In the application of electricity to the treatment of paralysis and tetanus, it is necessary to bear in mind two electro-physiological facts. The *first* is, that an electric current, if transmitted through a nerve for a certain period of time, destroys the sensibility of nerve, or, in other words, paralyses it. If allowed to remain in repose, the nerve, after a certain interval, recovers its excitability. But it has been ascertained by Matteucci that the excitability may be restored in a much shorter period by passing a second current through the nerve in the reverse direction. The *second* fact to be borne in mind is, that if the nerves of a living animal be submitted to the passage of the electric current, renewed at short intervals, tetanic contractions are excited; and if the experiment be continued for some time the nerves entirely lose their excitability.

"These are the facts," says Matteucci, "which, independently of all theory or hypothesis, should guide us in the therapeutical application of the electrical current to palsies. We may, in fact, admit that, in some cases of paralysis, the nerves of the affected limb are in a condition similar to that produced by the continued passage of an electric current. We have seen that, to restore the excitability to a nerve which had been deprived of it by an electric current, it is requisite to conduct the current in the opposite direction. Hence to cure the paralysis, the current should be passed in a contrary direction to that which has produced it. In a paralysis of motion the inverse current should be employed; while, on the contrary, in a paralysis of sensation, the direct current should be used. In a case of complete paralysis [that is, of both motion and sensation] there is no reason to induce us to prefer the one current to the other.

"Theory also teaches us a rule in its application: never to continue the passage of the current too long, lest we augment the disease we wish to cure. The more intense the current the shorter should be its duration; and as we have seen that the passage of the electric current in the nerves, repeated at short intervals of time, considerably enfeebles their sensibility, when continued for a long time, we must take care and not pass from one extreme to another. Theory advises us to apply the electric current of an intensity which should vary with the degree of the malady, and continue its passage for two or three minutes at intervals of some seconds. After these two or three minutes, during which we shall have communicated from twenty to thirty shocks, we should leave the patient at rest for some time, and then renew the treatment."

In 1838, Matteucci published a case of tetanus in which electricity was tried. During the passage of the current the convulsions ceased, and the patient opened his mouth. But the amelioration was only temporary, the disease being occasioned by the presence of some foreign bodies in the muscles of the leg.

He has shown that the prolonged passage of the uninterrupted current through a limb causes paralysis of the part. Hence he was led to suppose that the tetanic condition of a limb may be removed by inducing paralysis. And he found, in support of his notion, that frogs rendered

tetanic by nux vomica, lost this condition under the influence of an electric current.

In concluding our notice of M. Matteucci's electro-physiological researches, we beg to observe that we have considered it expedient to omit all notice of his interesting researches respecting the electrical phenomena of the *Torpedo* and *Gymnotus*, as likewise Savi's elaborate anatomical description of the nervous system, and of the electric organ of the *Torpedo*. It would have been impossible to have given an intelligible notice of these subjects in a reasonable compass, and we have preferred occupying our pages with those details which have a more immediate relation to human physiology, well knowing that those persons who take much interest in comparative anatomy and physiology, will procure Matteucci's work.

We have already expressed our opinion of the great scientific value and importance of Matteucci's researches. His book is illustrated by six plates, three of which refer to Savi's Anatomy of Torpedo. The Memoir of MM. Longet and Matteucci is very short, but is a highly interesting one; being devoted to an account of their discoveries of the different effects of electric currents on the different kinds of nerves. Of these discoveries we have given a tolerably full notice. This memoir, we perceive, has been reprinted in De la Rives' *Archives de l' Electricité*, published in October last.

PRINCIPLES OF HUMAN PHYSIOLOGY, WITH THEIR CHIEF APPLICATIONS TO PATHOLOGY, HYGIENE, AND FORENSIC MEDICINE. Especially designed for the Use of Students. 2nd Edition. By *W. B Carpenter* M.D., F.R.S.

IF it were practicable for us to carry our readers back to the state of physiological knowledge twenty years ago, as it was displayed in the teaching of the schools, and in the writings of authors, the satisfactory truth would become apparent, that not only has physiology, with its inseparable attendants, comparative and minute anatomy, kept pace with the rapid march of modern science, but, which must be regarded as an infinitely more important matter, that a much more philosophic spirit has been infused into this and all kindred researches. Physiologists have at length perceived that the actions of living bodies are to be studied in accordance with the same mode of procedure, as that adopted in the investigation of all other natural phenomena, of which procedure careful and extended observation must ever be regarded as the essential basis. They have, without entering into a compact similar to that of the geologists, who, vividly impressed with the evils resulting from mere speculation and slavish adherence to system, in founding their admirable society, announced its great object to be to encourage and record observations; the physiologists, we say, have tacitly come to a similar agreement, and rich and valuable have already been the results. Ceasing to be what Cuvier terms "Naturalistes de Cabinet," they have become *observers*—instead of continuing to speculate upon the respective shares of nervous power and

physical forces in supporting the operations of living bodies, they have contented themselves with ascertaining facts; and more than all, in place of regarding the phenomena of the animal economy as of a bizarre and mysterious character altogether sui generis, they have submitted them to the test of experiment, with the conviction that, although many of the vital actions are undoubtedly peculiar in their nature, yet as all of them occur in material substances, or, to borrow the happy expression of Dr. Arnott, as "life is a superstructure on physics and chemistry," the ordinary laws of matter must exert potential influence. The more the inquiry is extended, the more apparent will become the necessity of keeping prominently in view this great truth, which, in the sphere of the organic functions especially, is the very clue of the whole inquiry.

The general result of this improved mode of cultivating physiological science, has been to introduce more certain knowledge into all its branches; to substitute for vague surmises clear and definite notions; and by the aid of minute, developmental, and comparative anatomy, to establish the uniformity of the laws of organization. When such have been the fruits obtained in less than a quarter of a century, we may affirm, without indulging in vain and sanguine anticipations, that by a perseverence in the same path, the time is not distant when the science of life, surpassing as it does in absorbing interest all other branches of temporal knowledge, will, in the number of its facts and the soundness of its generalizations, closely approach the purely physical sciences—astronomy, mechanics, and chemistry.

Although we may be thus hopeful for the more philosophical branches of medical science, it cannot have escaped the attention of those who have watched the progress to which we have alluded, that hitherto few practical improvements of marked importance have resulted from the laborious researches of the last few years. The absence of such improvements have, we are aware, been urged by many men of eminence as a proof of the inutility of minute observations, and some think that much valuable time and talent are being wasted by the zealous cultivators of organization in the present day. In this opinion we do not participate; firstly, because the history of all the great achievements by which the convenience, the comfort, and the happiness of mankind have been secured, shows that the discoveries and labours of such men as Kepler, Hooke, and Black, barren and unprofitable as they appeared to their contemporaries, were the fruitful and necessary precursors to a multitude of subsequent practical appliances; and, secondly, because we contend that all which increases the scope of the intellect, and stores it with truths of a philosophic character, although possibly having no direct bearing upon the treatment of disease, is of higher import than any equal amount of technical information, inasmuch as it strengthens, invigorates, and disciplines that which is the source of all knowledge, the mind itself. We may perhaps be biassed in this matter, but considering the ample time which pupils are now required to devote to study, we regard it as a circumstance full of promise for future excellence and future progress, that chemistry, inorganic and organic; philosophic anatomy—vegetable, animal, and comparative; and scientific physiology, constituting, as it were, the mathematics of medical science, are now zealously and ably cultivated in our various schools.

It is in such a spirit and with such objects that the admirable work of Dr. Carpenter has been written; and it affords us much pleasure to find that it has so speedily reached a second edition; not only for the sake of its talented and industrious author, but more especially because, taken in connexion with the successful progress of other similar works, this circumstance may be received as a sure indication of a more elevated taste pervading the professional mind. As the former notice of Dr. Carpenter's work (*see Review, July* 1843) was from unavoidable circumstances necessarily incomplete, it will be our object in the present article to present an epitome of the contents of the volume before us, and also to add, when it may appear necessary, some of the more important facts derivable from other sources.

The arrangement of the functions is the same in the present edition as in the former one; and although we agree with the author that this is a matter of subordinate importance, yet as it seems to us desirable never unnecessarily to disturb the beautiful subordination and harmony evinced in the works of the Creation, we should have preferred, as being more in keeping with the natural relations of the nutritive and sentient phenomena, and we may add with the scientific character of the work itself, if those processes which are essential to all life, such as absorption, respiration, and assimilation, and on which the special actions of animal existence repose, had been in the first place investigated. The formation and actions of the human organism display such exactness, are submitted to such undeviating laws, and observe so definite a sequence, that in departing from the natural order the student soon finds himself in a labyrinth of intricacies and involvement. Dr. Carpenter has however avoided this inconvenience to a great extent, by prefixing to the account of the nervous system, a concise but comprehensive sketch of the functions, vegetative and animal, and of their mutual relations.

The advances of science have enabled the author to make considerable additions to the Second Edition. The following comprise the principal novelties:—

"1. The researches of Mr. Newport, (confirmatory in every important particular, of the Author's previously expressed views) on the structure and functions of the double Nervous cord of the Articulata, §§ 143, 146.

"2. Dr. Stirling's observations on the Spinal Cord, § 165.

"3. A more precise form given to the Author's own views, on the localization of the Emotional and Instinctive actions, §§ 259—265.

"4. Observations on the Nature and Destination of the Food of Animals; principally based on Prof. Liebig's views, §§ 430—434.

"5. Mr. Goodsir's researches on the absorbent Cells of the Intestinal Villi, §§ 461, 462.

"6. Researches of Mr. Addison and M. Bourgery on the structure of the Lungs, § 525.

"7. Researches of MM. Andral and Gavarret, and of Prof. Scharling, on Respiration, § 534 *note*, and § 544.

"8. The chapter on nutrition, including the history of the Chyle, Blood, and Tissues, almost wholly re-written; so as to include the results of the most recent observations on these subjects, and the views to which the Author has been led by them.

"9. The doctrine of Secretion by Cells, as developed by Henle, Goodsir, and others, § 651.

"10. The researches of Mr. Bowman on the structure and functions of the Malpighian bodies of the Kidney, §§ 667, 668.

"11. The account of the constitution of Urine lately given by Liebig, §§ 673—678.

"12. The inquiries of Dr. Lehmann, respecting the influence of diet on the constitution of the Urinary Secretion, §§ 679, 680.

"13. The researches of Dr. Evans on the structure of the Spleen, §§ 708, 709.

"14. The inquiries of Dr. Buchanan on the changes in the Blood produced by admixture of Chyle, §§ 714 *note*, 715.

"15. The investigations of Chossat on the effects of Inanition, § 730.

"16. The results of M. Raciborski's inquiries, in regard to the relation between the periods of Conception and Menstruation, § 742.

"17. The researches of Dr. Ritchie into the various conditions of the Ovaria, § 744."—*Preface*, p. 7.

After a brief exposition of the connexion of physiology with the other branches of medicine, the author, in order to fix the position of man in the zoological scale, and at the same time to trace the successive development and correlation of the various organs and functions as they make their appearance in the animal series, gives a comprehensive and well digested account of the several classes of the avertebrate and vertebrate divisions of the animal kingdom. In contrasting the internal and true skeleton of the vertebrata with the external skeleton as it is usually called of the invertebrate classes, Dr. Carpenter has a passage, which unexplained, is likely to mislead as to the true relations of the parts in question. "The skeletons, he remarks (p. 15,) of most of the invertebrata differ however from those of vertebrate animals in this important character, that they are not permeated by vessels, and are formed only by a superficial deposition." Although the author is of course himself aware of the real homology of these organs, yet it may not here be superfluous to point out that the outer covering of the body of radiate, articulate, and molluscous animals, whether consisting of a soft and yielding tegument, as in the common earth-worm, of a horny or calcareous envelope as in insects and crustaceans, or of a testaceous covering, as in the conchifera, is the corresponding part, not of the skeleton, but of the epidermis of the vertebrata. Like the epidermis, these coverings are in many instances repeatedly cast off, as in the metamorphoses of insects, and in the periodical change of the shells of crustacea. In many of the more minute animals, an entire identity may even be detected; in the monoculus, for example, a small fresh water crustacean, the external covering consists of a delicate epithelium, the cells of which, when viewed by the microscope, closely resemble epidermic scales; the same thing may be also observed in the familiar microscopic object called the skeleton larva.

It is in fact well known that, with various modifications, all animals possessing a distinct nervous system, have two skeletons:—the *neuro-skeleton*, often reduced to a fibrous membrane, as generally happens in the avertebrata,* and even in a few instances in the vertebrata, as in the case

* It is stated by Dr. Will (Müller's Archiv. 1844, p. 77,) that, in the avertebrate animals, the central parts of the nervous system, are covered by two membranes, of which the exterior one, in some instances, as in the cray-fish and

of the myxinoid fishes and amphioxus, surrounding the nervous centres; and a *dermo-skeleton* covering the surface of the body. One of the most interesting and instructive examples of this combination is afforded by the highest class of mollusks, the cephalopoda, in which, as in the nautilus pompilius, a rudimentary cranium, &c., in the state of cartilage, and an external shell, are met with in the same individual.

In considering the essential character of the skeleton of the vertebrata, the author well observes, we should look at its simplest forms—those in which it has the least number of superadded parts. This is a maxim of universal application in the study of organized bodies, for as the laws of Nature are fixed and definite, we may always expect to find that which constitutes the real and typical character of an organ revealed in the class of animals in which it first makes its appearance.

Applying this test in the case before us, we find the skeleton in the serpent tribe among reptiles, and in the eel and its allies among fishes, consisting of the spinal column with the cranium at its anterior extremity, and this evidently developed in reference to that which it is mainly formed to protect, the nervous centres, consisting of the brain and the spinal cord. The bone called a vertebra is then the typical part of the skeleton, for, as our author observes, "the cranium is in reality formed of the same elements as the vertebræ:" all other parts—limbs, chest, and pelvis, being subordinate, may or may not exist.

An interesting comparison is made by Dr. Carpenter, between the typical character of the articulated and molluscous animals and those of the vertebrata, which we regret our limits will not allow us to insert.

The existence of rudimentary lungs in the swimming bladder of the fish (a fact inferred by Hunter)—the combination in the batrachia of lungs and gills—and the now well-known fact that many other animals besides tadpoles and insects undergo a metamorphosis, are pointed out.

We must confine our notice of the general character of mammalia and man, to the following sketch of the leading peculiarities by which the human organism is distinguished from that of animals.

"Man cannot be regarded as distinguished from other Mammalia, however, either by acuteness of sensibility, or by muscular power. His swiftness in running, and agility in leaping, are inferior to that of other animals of his size,—the full grown Orang for example. The smallness of his face compared with that of the cranium, shows that the portion of the nervous system distributed to the organs of sense, is less developed in him than it is in most other animals; and the small proportional size of the ganglionic centres, with which these organs are immediately connected, is another indication of the same fact. Accordingly, he is surpassed by many in the acuteness of his sensibility to light, sound, &c.; but he stands alone in the power of *comparing* his sensations, and of drawing conclusions from them. Moreover, although none of his senses are very acute in his natural state, they are all moderately so, which is not the case in other animals; and they are capable (as is also his swiftness of foot) of being much improved by practice, especially when circumstances strongly call for their exercise. This power of adaptation to varieties in external conditions, which makes him

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gasteropods, consists of a peculiar cellular tissue, whilst in other cases, as in the leeches and insects, it is composed of the ordinary cellular tissue condensed around the ganglia.

to a great extent independent of them, is manifested in other features of his structure and economy. He is capable of sustaining the lowest, as well as the highest, extremes of temperature and of atmospheric pressure. In the former of these particulars, he is strikingly contrasted with the anthropoid Apes, such as the Chimpanzee, which is restricted to a few of the hottest parts of Africa, and the Orang Outan, which is only found in Borneo and Sumatra: these cannot be kept alive in temperate climates, without the assistance of artificial heat; and even when this is afforded, they speedily become diseased and die. His diet is naturally of a mixed kind; but he can support himself in health and strength, on either animal or vegetable food exclusively. It is by the demands which his peculiar condition makes upon the exercise of his ingenuity, that his mental powers are first called into active operation; but, when once aroused, their development has no assignable limit. The slow growth of Man, and the length of time during which he remains in a state of dependence upon his parents, have been already mentioned as peculiarities, by which he is distinguished from all other animals. He is unable to seek his own food, during at least the three first years of his life; and he does not attain to his full stature, until he is more than twenty years of age. In proportion to his size, too, the whole sum of his life is greater than that of other Mammalia. The greatest age of the horse, for example, which is an animal of much superior bulk, is between thirty and forty years. That of the Orang, which, when full grown, surpasses Man in stature, is about the same, so far as can be ascertained. The age to which the life of Man is frequently prolonged, is well known to be above a hundred years; and instances of such longevity are to be found in all nations." P. 54.

In the Second Chapter a succinct account is given of the functions or vital actions, and of their mutual relations, and to this part of the work we would call particular attention. "The idea of life, or vital action, obviously involves that of change. We do not consider any being as alive which is not undergoing some continual alteration perceptible to the senses."

Thus—"If we contemplate the history of the life of a plant, we perceive that it grows from a germ to a fabric of sometimes gigantic size,—generates a large quantity of organised structure, and many organic compounds, which form the products of secretion but do not undergo organization,—multiplies its species, by the production of germs similar to that from which it originated; but that it performs all these complex operations, without (so far as we can perceive) either feeling or thinking, without consciousness or will. All the functions of which its Life is composed, are, therefore, grouped together under the general designation of Functions of *Organic* or *Vegetative* life; and they are subdivided into those concerned in the maintenance of the structure of the individual, which are termed functions of *Nutrition*,—and those to which the *Reproduction* of the species is due.

"On analysing the operations which take place in the Animal body, we find that a large number of them are essentially the same in character with the foregoing, and differ only in the conditions under which they are performed; and that we may, in fact, readily separate the Organic functions, which are directly concerned in the maintenance of the fabric, from those of Animal life, the chief purpose of which is entirely different." P. 59.

In this latter passage is expressed the true nature of the nutritive processes of animals, which are essentially the same as those of plants, but on the whole infinitely more active, in consequence of the great law impressed upon organic beings, that all vital action causes a waste or disintegration of the instruments or organs employed. The incessant molecular change of the animal frame has been known from the earliest periods, and

there can be no doubt, as Dr. Carpenter infers, that this destructive process is not confined to the muscles, of which only Liebig in his celebrated treatise on Organic Chemistry has treated, but also occurs in the nervous and all other tissues, even the most dense, as the granules of bone and the ivory of the teeth. That admirable reasoner, Bishop Butler, has founded upon this incessant change of the nervous tissue a beautiful argument, that as the spiritual part of our nature is not affected by the gradual disintegration which is incessantly proceeding in the brain, and by which it is clear that in a given time the whole of it is changed, so in like manner, it is not difficult to conceive of the soul surviving the sudden and total destruction of that organ, the question resolving itself simply into one of degree, not of kind.

As we shall, in a succeeding number of our Journal, consider the additions which have lately been made to the physiology of the nervous system, we proceed to Chap. IV., which has for its title, "On Sensation and the Organs of the Senses."

"By the term *Sensation* is rightly understood that change in the condition of the mind, by which we become aware of an *impression* made upon some part of the body; or, in a briefer form of expression, it may be defined to be the *consciousness of an impression*. Some physiologists have, it is true, spoken of a *sensation without consciousness;* but it seems very desirable thus to limit the term; since the word *impression* may be very well applied to designate the change produced in the afferent nerves by an external cause, up to the point at which the mind becomes conscious of it. We have seen reason to believe, that the impressions communicated to the Spinal Cord may there excite motor actions, without occasioning true Sensation; and it would seem to be with the Brain only that the mind possesses the relation necessary for the production of such a change in it. Hence the Brain is spoken of as the *Sensorium*." P. 249.

We entirely coincide in the correctness of this definition, and in the necessity of limiting sensation to the brain. It has always appeared to us a profound error in physiology to admit any kind of sensation of which the mind is not conscious; indeed, the very notion of the phenomenon implies an act of consciousness, and when the presence of the latter cannot be proved or reasonably be inferred, it is only unnecessarily embarrassing the question to contend for the former.

In speaking of the connexion between the capillary circulation and nervous action, the author has, in our opinion, over-estimated the quantity of blood furnished to the nerves—an error very likely to arise in consequence of anatomists having drawn their conclusions from observations made principally on the tactile papillæ of the fingers. These parts are, it is true, provided with very rich vascular plexuses, but it must be remembered that a large proportion of the blood thus distributed is not for the supply of the nerves but of the secretory organs of the skin; a fact which is strikingly shown by the existence of a vast multitude of linear vascular tufts beneath the nail, where the nervous twigs are comparatively few in number and the sensation dull. If a trunk of a nerve be injected and be then examined microscopically, the vascularity is seen to be but moderate. The only parts of the nervous system which are in reality very richly supplied with blood, are the active centres—the brain, the spinal chord, and the sympathetic ganglia.

The following observations are so expressive of what must ever be regarded as a fundamental law of sensation that we give the passage entire:—

"It may hence be inferred that no nerve of *special* sensation can, by any possibility, take on the function of another. How far the nerves of *common* sensation can, under any circumstances, perform the offices usually delegated to those of special sense, we are not yet in a condition to determine. Comparative Anatomy seems to show that, in the lowest animals in which the rudiments of eyes can be detected, there is no distinction between the nerves proceeding to these organs, and the rest; and there would appear some ground for the belief that, as in other cases, the special organs of sensibility are gradually elaborated, in ascending the Animal scale, from the more general apparatus, and are not merely superadded to it. Hence, we may conceive the possibility (though there is no proof of the fact) that states of the system might occur, in which a change in the common sensory nerves might produce the sensation of light, sound, &c. But it is quite impossible (so far, at least, as our present knowledge of physical phenomena permits us to decide upon the impossibility of anything) that distinct visual impressions should be communicated to a nerve, except through the mediation of such an optical instrument as the eye; or distinct sonorous impressions, except through such an acoustic instrument as the ear. Hence we must receive with the greatest caution the wonderful accounts of transference of sensation, many of which have undoubtedly been the offspring of deception. Still it may be objected that, as we are so totally destitute of real knowledge, as to the mode in which vision is ordinarily produced by inverted images upon the retina, we have no right to assert that it *may not* take place in some other way; and perhaps this objection should lead us to consider the phenomenon rather as *extremely improbable*, than as *impossible*. But the improbability may be compared to that of a stone ascending like a balloon, or a piece of lead floating on the water; for we have no more knowledge of the ultimate cause of that which we term the force of Gravitation, than we have of the nature of Sensation." P. 257.

So strictly is this the case that each nerve of sense, whenever and however excited, never produces any other than its own special action; thus, if the retina be struck, a flash of light is perceived; if the auditory nerve be stimulated by a congested or inflammatory state of its blood-vessels, a singing or rumbling noise is the result; if the nerves of the skin be excited, in whatever manner, a sensation of touch is caused. These, and a multitude of other similar phenomena more particularly connected with what are termed *subjective sensations*, demonstrate, at least if any process of inductive argument is to be deemed conclusive, that clairvoyance in all its shades and shapes is a physiological impossibility.

In the section upon touch, a reference is made to the interesting facts ascertained by that admirable and sound anatomist, Professor Weber,* and which are well worthy of careful perusal. (P. 262.)

In connexion with this subject, Dr. Carpenter well remarks "that the conditions under which certain of the modifications of common sensation

* We have often regretted that the comprehensive and standard work of Hildebrandt, Handbuch der Anatomie des Menschen, edited and greatly improved by Prof. G. H. Weber, has not been rendered available, by translation, to the English student.

operate, are in some respects different from those of ordinary Touch is very easily shown. Thus, the feeling of tickling is excited most readily in parts which have the least tactual sensibility, the armpits, flanks, and soles of the feet, whilst in the points of the fingers it cannot be excited." The fact also that the susceptibility of the surface to temperature does not correspond to the acuteness of touch is pointed out, and in connexion with this point we would remark, that certain anomalous instances of local loss of sensation, would almost induce us to infer that the power, if not the nervous fibrils themselves, by which we judge of variations of temperature, is altogether distinct from the perception of mere contact. A case confirmatory of this view was related to us by an intelligent practitioner, of a patient who, although he had lost the sensation of touch in the skin of one of the lower extremities, so that he was not conscious of contact, still retained in the affected part the perception of heat and cold.

The sense of taste, according to the author, ought to be considered as a peculiar modification of that of touch, but in this position we do not agree. The common experience of mankind might, we think, be adduced to show that these two faculties are essentially distinct in kind. The difference in the ultimate texture of nerves having undoubtedly separate offices, is not so marked as to enable us to pronounce upon the functions of a part simply upon the grounds of anatomy; and, consequently, the fact of a part of the fifth pair supplying the organ of taste, for we regard, notwithstanding the experiments of Panizza, the lingual to be the true nerve of taste, is not sufficient to disprove the existence of special fibres being allotted to that sense.

The sections on the senses of Vision and Hearing are written in a philosophic spirit, and are worthy of careful consideration, but some space having been devoted to these subjects in a former review, we can only here quote the following passage illustrative of the complex character of what, in the absence of such evidence, might be regarded as simple ideas.

"The sense of Vision depends, in the first place, on the transference to our minds of the picture which is formed upon the retina; this picture puts us in possession of the outlines, lights and shades, colours and relative positions, of the objects before us: and all the ideas respecting the real forms, distances, &c., of bodies, which we found upon these data, must be considered in the light of *perceptions* either instinctive or acquired. Many of these are derived through the combination, in our minds, of the visual sensations, with those derived from the sense of touch. Thus, to take a most simple illustration, the idea of *smoothness* is one essentially tactile; and yet it constantly occurs to us, on looking at a surface which reflects light in a particular manner. But, if it were not for the association, which experience leads us to form, of the connection between *polish* as seen by the *eye*, and *smoothness* as felt by the *touch*, we should not be able to determine, as we now can do, the existence of both these qualities, from an impression communicated to us through either sense singly." P. 277.

In treating of the muscular system, the author has availed himself of the excellent researches of Mr. Bowman; but we regret that, in such a treatise, no reference is made to the important researches of Matteucci, upon muscular contractility.

The second division of the work comprehends the organic functions to which, in the present edition, considerable additions have been made.

In the history of the digestive process the celebrated and well-known investigations of Dr. Beaumont are throughout adopted. The observations of Mr. Goodsir on the structure and action of the intestinal villi, are thus recorded and adopted:—

"From the recent observations of Mr. Goodsir, it appears that the villi are enclosed in a very delicate membrane (analogous to that which lies under the epidermis and epithelium in the skin and mucous membrane;) and that, when digestion is not going on, they are covered by an epithelium. The space between the reticulations of the blood-vessels and lymphatics, towards the extremity of each villus, is occupied, whilst the absorption of chyle is taking place, by a number of spherical vesicles or cells, varying in diameter from the 1-1000th to 1-2000th of an inch, and containing an opalescent fluid. At the part where the vesicles approach the granular texture of the substance of the villus, minute granular or oily particles are seen. When the intestine contains no more chyme, the vesicles disappear almost entirely, the lacteals empty themselves, and the villi become flaccid; the epithelium, which had fallen off during the process of Absorption, is then renewed. The vesicles at the extremities of the villi can scarcely be regarded in any other light than as *cells*, whose lives have but a very brief duration,—selecting from the materials in contact with the surface of the villi, and appropriating these to their own growth,—then liberating them by solution or disruption of the cell-wall, in a situation where they can be absorbed by the lacteals." P. 395.

In connexion with cutaneous absorption, some interesting examples are quoted from different writers, showing the great activity and importance of the process. Dr. S. Smith mentions that a man who had lost nearly three pounds by perspiration during an hour and a quarter's labour in a very hot atmosphere, regained eight ounces by immersion in a warm bath for half an hour. Dr. Dill relates the case of a diabetic patient who, for five weeks, passed 24 lbs. of urine every twenty-four hours, his ingesta during the same period amounting to 22 lbs.; and as he had lost in weight only 27 lbs. when he died, there must have been an absorption of 43 lbs. from the atmosphere during the time.

In treating of the respiratory organs the author truly observes that "in regard to the intimate structure of the lungs of Man and of the Mammalia it is difficult to speak with confidence."

The account of Reisseissen, according to which the air-cells are merely the globular dilatations of the ultimate ramifications of the bronchial tubes, is certainly erroneous: nor is the opinion of Mr. Addison much more satisfactory, that the air-cells do not exist prior to birth, but that they are produced by the parietes of the minute bronchial tubes becoming dilated into little pouches, in consequence of the pressure exerted by the atmospheric air admitted into the lungs in respiration.

An excellent paper upon this subject, containing the results of a careful examination of the pulmonary texture, made by Mr. Rainey, of St. Thomas's Hospital, has been lately read before the Medico-Chirurgical Society; and as these investigations, in addition to affording clear and satisfactory evidence upon many points which are at present a matter of dispute and uncertainty, contain some novel facts, a brief allusion to them will not be misplaced.

The principal results are as follows:—

1. A bronchus, when traced from its commencement to its termination,

is seen to be in the first part of its course more or less cartilaginous; it then becomes destitute of cartilage, retaining however a perfectly circular form, and having no air-cells opening into it; farther on, being still circular, numerous air-cells open into it; lastly, the air-cells increase so much in number, and open into the bronchus so closely to one another, that the tube can no longer retain its circular form, but becomes reduced to an irregular passage, running between the cells, and ultimately reaching the surface of the lobule, ends by forming a terminal air-cell.

2. The air-cells are small irregularly-shaped cavities, having generally four or five unequal sides; those which are situated close to the small bronchial passages open into them by well-defined circular apertures, whilst those which are situated at a distance from these passages open one into the other, an arrangement which those who are acquainted with the disposition of the air-cells in the injected lung of the frog and serpent will readily comprehend; in fact, *each lobule of the lung of the mammal and man, with its bronchial passages and appended cells, may in some sort be regarded as a repetition of the whole lung of the frog.*

3. The border of each air-cell is surrounded, in addition to the epithelium, by a number of fibres definitely arranged in a circular manner, so as to form a circumscribed limit to each cell. The fibres appear to be elastic, and have no resemblance whatever to muscular fibres, stripped or unstripped.

4. The sides or walls of the air-cells consist of a dense plexus of capillaries, situated in the interior of the lobules, between two layers of the pulmonary membrane; but on their exterior between this membrane and the pleura in the case of the lobules on the outer surface of the lung, or between it and the interlobular areolar tissue in those lobules which bound the interlobular spaces. There is thus, between every two cells only one vascular network, so that the small stream of blood in each capillary vessel is acted on by the air upon both sides, whilst in the frog, serpent, &c., there being two plexuses of vessels between two cells, the blood in the capillaries is only aerated on one side.

5. The number of capillary plexuses is not the same as that of the air-cells, one net-work passing between and supplying several cells; or in other words, one terminal branch of the pulmonary artery supplies the plexuses of several air-cells.

6. An important part of these investigations relates to the anatomy of the fœtal lungs, prior to the act of respiration; these, when well injected, are distinctly seen to possess air-cells, fully formed and surrounded, as in the animal which has respired, by plexuses of blood-vessels.

As we trust that the whole of this valuable paper will be speedily published, we do not notice the interesting observations of Mr. Rainey upon the seat and effects of tubercle.

Dr. Carpenter alludes to the researches of M. Bourgery upon the force of the respiratory muscles, and the capacity of the lungs at different periods of life and in the two sexes. According to these inquiries the development of the air-cells continues up to the age of 30, at which time the capacity of respiration is the greatest; it subsequently decreases, especially in persons who suffer from cough, the violence of such expiratory effort frequently causes rupture of the air-cells, and thus gradually pro-

duces that emphysematous state of the lungs, which is so common in elderly persons. The power of increasing the volume of air by a forced inspiration is much greater in young than in old persons, and is twice as great in males than in females of the same age, a circumstance which is evidently connected with the extent to which muscular efforts can be carried in these classes respectively.

Since the work before us was written, a valuable contribution to the physiology of the respiratory muscles and the capacity of the lungs, has been made by Mr. Hutchinson, in a paper read before the Statistical Society, and subsequently published in their Journal, for September, 1844. The deductions of this gentleman rest upon an extended basis, and the results being tabulated and accompanied with illustrative diagrams, are readily comprehended.

By the term "*capacity*" Mr. Hutchinson "signifies that quantity of air which an individual can force out of his chest by the greatest voluntary expiration, after the greatest voluntary inspiration." The experiments respecting "capacity," were made with the assistance of an instrument called the *spirometer*, or "breath-meter," and those on the force of the muscles by a mercurial gauge.

It has long been known that the quantity of air capable of being admitted into the lungs varies in different individuals, and these researches have established this in a remarkable degree, showing the modifying effects of stature and occupation, and of health and disease. Thus, the mean "capacity" of 172 males under the height of 5 feet 8 inches is 220 cubic inches, whilst that of 82 males of from 5 feet 11 inches to 6 feet, is 255 cubic inches. It is clearly a desirable thing to discover the cause of such a marked difference, and Mr. Hutchinson asserts that he has "discovered a relation intimately existing between this capacity and power and the *height* of the individual," and further on, states it to be a rule that "*for every inch of height* (from 5 to 6 feet) *eight additional cubic inches of air at* 60° *are given out by a forced expiration.*" The exceptions to this rule among healthy persons, occur among very stout and corpulant individuals, whose capacity stands the lowest. This, if confirmed, is a very interesting generalization, and strongly supports, both by the rule and its exception, the chemical theory of animal temperature; for it thus appears that the activity of the heating apparatus, the lungs, is definitively proportioned to the bulk of the body to be warmed, except in the case of fat persons, in whom a thick layer of adipose matter, which is a bad conductor of heat, exists on the surface of the body.

Another curious and unexpected result is, that the force of the expiratory muscles is about one third stronger than that of the inspiratory; thus whilst a person of 5 feet six inches elevates the mercury 3·87 inches by the power of his expiration, he only raises it 2·70 inches by his inspiration. This difference depends probably more upon the favourable leverage of the abdominal muscles on the fore part of the trunk, and the erectores spinæ behind, than upon the actual size of those muscles when contrasted with the diaphragm, pectorales, serrati, and the other muscles of the inspiratory class.

The effects of employment, diet, and disease are strikingly shown; for example, in the early stage of phthisis the healthy "capacity"' being

204 cubic inches, the capacity of the diseased lungs was in some cases 135 cubic inches; and in the advanced stage, as would be anticipated from the evidence of morbid anatomy, the difference becomes much greater, so that the "capacity" of a person, which in health would be 229 cubic inches, was reduced to 80 cubic inches. Mr. Hutchinson conceives that his tests afford an additional and important means of detecting the existence and extent of pulmonary disease; and even of discovering other affections, such as hernia and perforation of the membrana tympani, seated in organs indirectly related to the respiratory apparatus.

The chapter on Nutrition having been, as the author states, almost entirely re-written, contains the most recent inquiries upon the subject. The admirable researches of Dr. Prout, since confirmed and extended by the German school, have shown that all the azotised parts of the animal body are derived from one peculiar proximate principle, called by Prout *albumen*, and by Mulder *protein*; if to this we add fatty matter, certain salts, and water, we have all the materials required for the nutrition of animals. In illustration of his views, Dr. Prout has selected milk as an example, observing that "milk is designed and prepared by nature expressly as food, and it is the *only material* throughout the range of organization that is so prepared. In milk, therefore, we should expect to find a model of what an alimentary substance ought to be—a kind of prototype, as it were, of nutritious matter in general."

We have ourselves, however, always considered the ovum as a case more in point, on account of its containing only one protein compound, albumen, and this is the instance adduced by Dr. Carpenter. From the albuminous matter of the egg of the fowl all the various and complex organs are derived, the first and most essential part of the process consisting in the conversion of that substance into fibrin, which is to be regarded as the *plastic* or *organizable* constituent of the body. "To use a rather homely illustration, albumen, fibrin, and organized tissue, stand much in the same relation to each other, with raw cotton, spun yarn, and the woven fabric." Now the conversion here alluded to, is, we must presume, effected by the agency of those important organic instruments called *nucleated cells*, of the powers of which the author has given a full account in the several divisions of his work relating to the nutritive actions.

There is no discovery of modern times which has worked such mighty changes in established opinions, as that connected with the *cell theory*, which, originating in the researches of Schleiden into the ultimate texture of vegetables, was extended in the celebrated work of Schwann (Mikroskopische Untersuchungen, &c.) to the organization of animal structures. By these investigations, it has been ascertained, that with some few exceptional cases, every part of every animal and plant is, in the first epoch of its formation, developed from a nucleated cell; that by the inherent and independent powers of this cell and by the metamorphoses it experiences all the organic tissues are formed; and, more than all, that every act of the process of nutrition—secretion—absorption—assimilation—growth, and decay, instead of being, as until this theory they were in all the higher animals invariably considered to be, immediately dependent upon the blood-vessels and absorbents, are in reality accomplished by parts which are essentially extra-vascular. Although the facts here announced

have received the concurrent sanction of all accurate observers in every part of Europe, yet as we have reason to know that among many of our professional brethren, a lingering attachment to former doctrines, and an indisposition to admit the somewhat startling deductions which have flowed from the observations of Schwann and his numerous followers, still prevail, a few remarks on the subject may not be misplaced.

When we recall to mind the extreme simplicity, the undeviating uniformity, the mathematical exactness of all the great laws of Nature, it is not difficult to comprehend that the mechanism by which one great class of vital actions, the nutritive, are sustained, should present a common type. The humblest of the cellular plants displays phenomena which are essentially the same as those which in the aggregate constitute the organic life of the most complex animal:—it absorbs nutriment—it grows—it reproduces, and thus maintains its own existence and that of its species. A similar series of actions are performed in the simplest classes of the animal creation, and in both instances the only organs which can be detected are—cells. Now, if we turn to the most elaborately constructed animal, to the human body itself, what do we find? The embryo, as we learn from Martin Barry's admirable investigations, taking its rise from a single cell—the formation of a membrane, the vesicula germinativa—the development to a considerable extent of the nervous centres—the deposition of the commencing vertebral column—all these phenomena occurring antecedently to the appearance of blood-vessels and of their central organ, the so-called punctum saliens. If from the nutritive process of the embryo we turn to that of the adult, the same kind of evidence is afforded of the predominant action of cells, and the subordinate agency of vessels. Thus the active and essential part of every organ, that in fact which constitutes the organ, is extra-vascular. No artery penetrates the sarcolemma, the ultimate nervous tubule, or the efficient agent of the various glands. Again, few organs appear to be more vascular than the mucous coat of the small intestine; and yet here the parts engaged in the secretion of mucus and the absorption of the chyle, are seen to consist of epithelial cells; even the more simple membranes, the serous and the synovial, those in which, if any where, the direct action of the capillary vessels might be expected, present in the place of the exhalent arteries of former anatomists, a layer of delicate epithelial cells, the true agents of the secretion.

All this appears somewhat startling, but when the matter is presented to our notice in its simplest form, the truth of it becomes obvious:—for example, the animal machine consists in addition to blood-vessels of several different solid substances, muscle—nerve—bone. Now as two bodies cannot occupy the same space at the same time, it plainly follows that all these substances must be placed beyond the tubes carrying the blood, and this fact being once understood, all the details respecting the degrees and relations of vascularity become questions of secondary importance. The axiom, therefore, that organization is co-extensive with, and dependent upon vascularity, must henceforth be abandoned, and with it will vanish a crowd of errors and apparent anomalies respecting the vitality of parts wanting blood, such as the epidermis and cartilage in vertebrated animals, and the entire organism of many of the more simple classes among the invertebrata. We will only further remark, that the great principle thus

established, that throughout the organic creation, the nutritive process is effected by one typical formation, the nucleated cell, is a generalization which promises to effect for structural anatomy, what the law of correlation has accomplished for comparative anatomy, and that of definite proportions for the science of chemistry.

Dr. Carpenter, who has adopted in all their extent the views at which we have glanced, regarding cells or vesicles as the primordia of all vegetable and animal tissues, gives a comprehensive account of the subject, from which, however, we can only extract one or two passages.

"A very large proportion of the Vegetable Organism (in the simplest Plants, the entire structure) is made up of *cells* or *vesicles*; which are minute closed sacs, whose walls are composed in the first instance of a delicate membrane, frequently strengthened, at a period long subsequent to their first formation, by some internal deposit. The form of these cells is extremely variable; and depends chiefly upon the degree and direction of the pressure, to which they may have been subjected at the period of their origin, and subsequently to it. Sometimes they are spheroidal; sometimes cubical or prismatic; sometimes cylindrical; and sometimes very much prolonged. These cells may undergo various transformations.—One of the most common, is the conversion of several into a continuous tube or Duct.

"The Animal body exhibits phenomena, of a character essentially the same. Even in the fully-formed organism, many parts may be found, which are composed, more or less evidently, of isolated cells or vesicles, analogous to those of Plants; and it has been clearly proved that, in its early condition, the whole fabric has this character. In fact, it has been shown by the researches of Barry, Schwann, and Valentin, that the whole structure originates in a single cell; that this cell gives birth to others analogous to itself, and these again to many future generations; and that all the varied tissues of the Animal body are developed from these, although no difference can be in the first instance observed among them.

"From what has been stated, it appears evident that the process of Nutrition mainly consists in the growth of the individual cells composing the fabric; and that these derive their support from the organic compounds with which they are supplied by the blood, just as the cells composing the simplest Plants derive theirs from the inorganic elements which surround them: and as different species of the latter select and combine these, in such modes and proportions, as to give rise to organisms of very diversified forms and properties, so is it easily intelligible that the different parts of the fabric of the highest Animals should exercise a similar selective power, in regard to the materials with which the blood supplies them. The structure composing every separate portion of the body has (what may be termed) a *special affinity* for some particular constituents of the blood; causing it to abstract from that fluid, and to convert into its own substance, certain of its elements. The conversion is termed *Assimilation*." P. 487.

The principal novelty contained in the account of the blood, relates to the *white*, or more correctly speaking the *colourless* corpuscles, which it is inferred by the author exercise a power of assimilation or conversion, by transforming the aplastic into the plastic material, or, in other words, albumen into fibrin. It may be well to premise that in addition to the well-known red particles, the circulating fluid of man and all vertebrate animals contain colourless corpuscles called lymph globules, and, according to Donné and Gulliver, certain minute spheres, called by the former *globulins*. In the avertebrate animals, although there are no red discs, the blood contains a number of colourless corpuscles, which were thought by Hewson,

who clearly describes them, to be "similar in shape to those of the blood of more perfect animals, but differing in colour;" whilst by Wagner, whose views are adopted by the author, they are regarded as being analogous with the colourless or lymph corpuscles of the vertebrata.

Dr. Carpenter's reasons for concluding that the conversion of albumen into fibrin is effected by the colourless rather than by the red corpuscles are principally these :—

1. That the process of nutrition is essentially the same in the avertebrate as in the vertebrate animals, and yet in the former there are only white or colourless corpuscles.

2. That the chyle in which the formation of fibrin takes place, contains white corpuscles.

3. That in very young embryos, where the process of assimilation must be most active, the white corpuscles are, according to the observation of Mr. Gulliver, nearly as numerous as the red particles.

4. That in inflammation, where the quantity of fibrin is well known to be remarkably increased, a great accumulation of white corpuscles takes place in the vessels of the inflamed part, as Mr. Addison, Dr. Williams, Mr. Gulliver and others have proved by microscopic observation.

5. That the number of red corpuscles neither undergoes any decided change in inflammation, nor does it bear a distinct proportion to the activity of the formative process in the different classes of animals.

Lastly, that whilst the red particles are greatly diminished in number by repeated losses of blood, the colourless corpuscles and the fibrin are increased. (Pp. 506, 509.)

The elaborating power thus assigned to the colourless or lymph globules, has been attributed with equal confidence by Mr. W. Jones in this country, and less distinctly by Wagner and Henle, in Germany, to the red corpuscles.

As it is not our intention to enter into the merits of these conflicting theories, we shall content ourselves with remarking that there is sufficient evidence to show that both the red and colourless corpuscles ought to be considered as *floating cells;* this we regard as proved by the following facts :—

1. The former in fishes, reptiles, and birds, consist each of a vesicle and central nucleus; and although in mammals the latter appears to be absent, this circumstance alone is not sufficient to disprove the cell character, inasmuch as the nucleus very commonly disappears in vegetable cells, and because cells may even be primitively formed, though very rarely, without nuclei. 2. The red particles distinctly evince the powers of endosmose and exosmose, as Hewson, without, however, discovering the real nature of the process, long since proved by repeated experiments. 3. In their first formation they possess in all classes, whatever may be their ultimate form, whether that of a bi-convex ellipse or a bi-concave circular disc, the typical figure of all cells, namely, that of a globe or sphere. 4. The colourless corpuscle invariably consists of a vesicle with a nucleus. We have thus in the blood instruments competent to effect changes in their contents; and the balance of evidence tends to prove that such changes do really take place in the qualities of the blood and of the chyle whilst circulating in their containing vessels. More than this at present we are

not inclined to affirm, but the subject is too important, both as regards the healthy and diseased conditions of the body, to remain long undecided.

The section on the Pathological Changes of the Blood (p. 518) merits a careful perusal; for it is quite clear that, whilst we eschew the fanciful and erroneous parts of the humoral pathology, a more important influence in the production of disease than is usually admitted must be assigned to the blood. In the truth of the following remarks we entirely agree:—

"From the part which the Blood performs in the ordinary processes of Nutrition, it cannot be doubted that it undergoes important alterations, when these processes take place in an abnormal manner. These alterations must be sometimes the causes, and sometimes the effects, of the morbid phenomena, which constitute what we term the Disease. Thus, when some local cause, affecting the solid tissues of a certain part of the body, produces Inflammation in them, their normal relation to the blood is altered; the consequence is, that the blood, in passing through them, undergoes a different set of changes from those, for which it is originally adapted; and thus its own character undergoes a change, which soon becomes evident throughout the whole mass of the circulating fluid, and is, in its turn, the cause of morbid phenomena in remote parts of the system. On the other hand, the strong analogy between many Constitutional diseases, and the effects of poisonous agents introduced into the blood, appears clearly to point to the inference, that these diseases are due to the action of some morbific matter, which has been directly introduced into the current of the circulating fluid, and which has affected both its physical and its vital properties."* P. 518.

The account of the formation of the organic tissues, comprises the latest researches, and presents a somewhat extended summary of this important branch of physiological anatomy. The following is an interesting application of microscopic investigation in a subject which has always puzzled the pathologist.

"It is quite evident that the active *Growth* of the Hair can only take place at its base, where alone it is in connection with the vascular system; but the knowledge of its organised structure enables us to explain many phenomena which were previously obscure. Thus, in the disease termed Plica Polonica, a change takes place in the Hair, which often occurs at a distance from its roots; this change consists in the splitting of the hair into fibres, and the exudation from it of a glutinous substance; and these two causes unite in occasioning that peculiar *matting* of the hair, which has given origin to the name of the disease. It is said that bleeding takes place, in this disease, from the stumps of hairs which are cut off close to the skin; and this may be easily credited, since the increased activity in the formative power of the cells of the hair, must require an increase in their supply of blood. It is very easy to understand, from the analogy of the

* "This doctrine has been recently brought prominently forwards, in a Paper on Symmetrical Diseases, read by Dr. William Budd before the Medico-Chirurgical Society, Dec. 16, 1841. The author ingeniously proves, that the symmetry of many diseases (such as certain forms of cutaneous eruptions, rheumatism, &c.) which do not immediately depend upon external causes, necessarily involves the idea of the conveyance of the morbific agent in the circulating fluid; the palsy produced by lead is a very interesting example, in which the agent is known to be mingled with the blood, and to be deposited in the parts affected, which are generally, if not always, symmetrical."

Cellular Plants in which no vessels exist, how the fluid that is supplied to the base of the hair may find its way upwards; and there seems reason to believe, from the well-known fact of sudden change of colour in the Hair under the influence of strong mental emotions, that, even in its healthy state, fluid secreted at the base may be conveyed to its point." P. 551.

Mr. Toynbee's excellent memoir on Non-vascular Tissues is noticed. This is a question of great interest to practitioners, as it is involved in several classes of disease, especially those of the articular cartilages, cornea, and crystalline lens, all of which are, when fully formed and in health, *non-vascular.* The disposition of the blood-vessels in relation with these parts will be readily comprehended by a few extracts.

"The *cellular* (that is the articular) Cartilages are never *penetrated* by vessels in the healthy state, although in certain diseased conditions they become distinctly vascular. They are, however, *surrounded* by Blood-vessels; which form large ampullæ or vericose dilatations at their edges or on their surfaces : and from these the cartilages derive their nourishment by imbibition, in exactly the same manner as the frond of a sea-weed (the structure of which is alike cellular) draws into itself the requisite fluid from the surrounding medium." P. 553.

"At an early period of fœtal life, there is no distinction between the cartilage that is ultimately to become the Osseous Epiphysis, and that which is to remain as Articular Cartilage ; both are alike cellular ; and the vessels that supply them with nutrient materials penetrate no further than their surfaces. At a subsequent period, however, when the ossification of the epiphysal cartilage is about to commence, vessels are prolonged into it ; and a distinct line of demarcation is seen betwixt the *vascular* portion, which is to be converted into Bone, and the *non-vascular* part, which is to remain as Cartilage." P. 554.

"No vessels can be traced (according to Mr. Toynbee) into the substance of the true Cornea ; which, contrary to the statement of Müller, is a cellular rather than a fibrous cartilage. The cells are not so numerous as are those of the articular cartilages; and they are surrounded by a plexus of bright fibres, laxly connected together, so as to resemble areolar tissue. Two sets of vessels, a superficial and a deep-seated, surround the margin of the cornea. The arteries of the former are prolonged for a short distance upon the Conjunctival membrane, which forms the outer lamina of the cornea; but they terminate in veins at from $\frac{1}{8}$ to $\frac{1}{2}$ a line from its margin. The deep-seated vessels belong to the cornea proper; but they do not enter it, the arteries terminating in veins just where the tissue of the Sclerotic becomes continuous with that of the Cornea. In diseased conditions of the cornea (as of the articular cartilages), both sets of vessels extend themselves through it; the superficial not unfrequently form a dark band of considerable breadth round its margin ; whilst the deep-seated are prolonged into its entire substance." P. 555.

One of the highest authorities in this branch of surgery remarks, that although vessels in ulceration of the cornea frequently become so much enlarged as to admit red blood, "yet there can be no doubt that ulcers do heal without a single red vessel making its appearance." In this latter instance the common opinion is that, as union cannot take place without the co-operation of blood-vessels, minute capillaries, the so called *vasa serosa,* deposit the plastic substance; but in the present state of our knowledge respecting nutrition, and especially with the facts before us which Mr. Toynbee has established, we are inclined to believe that the reparative process may and does occasionally take place in the cornea without the agency of vessels.

After what we have stated respecting the agency of cells, the facts just quoted, which a few years ago would have seemed to be perfectly anomalous, are readily interpreted. The blood-vessels in *all* organs, may, as to their disposition, be compared to the canals which are cut for the irrigation of a meadow;—they are carriers of nutritive matter—they surround, but do not themselves penetrate, the islands which they enclose; so that the only difference between the parts called *non-vascular* and the rest of the body is that which relates to the size of islets surrounded by the blood channels. The whole question thus resolves itself into one of degree, not of kind.

We close our remarks on nutrition by the following passage:—

"From the foregoing details the obvious inference results,—that each part of the organism has an individual Life of its own, whilst contributing to uphold the general Life of the entire being. This Life, or state of Vital Action, depends upon the due performance of the functions of all the subordinate parts, which are closely connected together. The lowest classes of organized beings are made up of repetitions of the same elements; and each part, therefore, can perform its functions in great degree independently of the rest. But, in ascending the scale, we find that the lives of the individual parts become gradually merged (so to speak) in the general life of the structure; for these parts gradually become more and more different in function, and therefore more and more dependent on each other for their means of support; so that the activity of all is necessary for the maintenance of any one. Hence the interruption of the function of any important organ is followed by the Death of the whole structure: because it interferes with the elaboration, circulation, or purification of that nutritious fluid, which supplies the pabulum for the growth and reproduction of the individual parts. But *their* lives may be prolonged for a greater or less duration, after the suspension of the regular series of their combined actions; hence it is, that *molecular* Death is not always an immediate sequence of *somatic* Death." P. 580.

In the chapter on Secretion many additional and important researches have been incorporated with the present edition; but our notice has already been so much extended, that we can only call attention to the admirable investigations of Mr. Bowman into the structure of the Malpighian bodies of the kidneys, and to those of Liebig and Lehmann respecting the chemical analysis of the urine.

The work concludes with a description of the reproductive process. This branch of physiology has received a vast addition in late years from the inquiries of such writers as Baer, Purkinje, Wagner, W. Jones, Coste, Valentin, and still more recently by the admirable researches of Martin Barry and Bischoff. Our space, however, will allow us merely to notice one or two of the latest facts which have been established.

One of the most novel of these additions relates to the maturation and discharge of ova in the human female at the menstrual period. It is a general law that the ova in all animals when they have attained their maturity, *whether impregnated or not*, are discharged from the ovary. The oviparous animals, for obvious reasons, afford the most striking illustration of this law, inasmuch as their large ova are readily recognized: now in these, as in the frog, tortoise, and common fowl, it is well known that eggs are laid even when the male has had no access to the female. But in the case of mammals, the minute size of the ovum renders similar observations upon their discharge a much more difficult matter; and hence

it has happened, that although many physiologists, among whom we may mention Dr. Haighton and Dr. Blundell, have determined the fact that ova may become matured and be discharged independently of sexual connection, yet these were regarded as occasional phenomena which could not be referred to any general law. Latterly, however, and especially by the careful observations of Dr. R. Lee, MM. Gendrin, Negrier, Raciborski, Bischoff, and Dr. Ritchie, it has been rendered very probable that at every menstrual period, an ovum, already sufficiently developed to become, under the necessary conditions, impregnated, escapes from the ovary into the uterus. The inference therefore is, that a short time prior to menstruation, an ovum is prepared and ready for fecundation; that, consequent upon this preparation, a vascular activity is set up in the uterus, which, as it is well known, sympathizes in a remarkable and constant manner with the ovarium, in order to form the decidua; that, no impregnation occurring, the enlarged ovum bursts from its ovi-sac or Graafian follicle and descends by the Fallopian tube into the uterus, and forming no attachment to the inner surface of that organ, escapes externally; whilst the enlarged uterine blood-vessels, having now no functional office to accomplish, are relieved by the catamenia, and thus shortly return to their more ordinary condition. This is probably the usual process which appears to be analogous to the *heat* of the lower animals; but there are many deviations from it, so that "menstruation may take place without any such rupture; whilst, on the other hand, the maturation and discharge of mature ova may occur in the intervals of menstruation." (P. 688.)

The phenomena above noticed belong to a more general law of the animal economy, called by the German writers *Organic Periodicity*, and to which considerable attention has of late been directed in this country by Dr. Laycock, and by Quetelet and others on the Continent. That such a law does prevail is rendered probable by the diurnal variations in the frequency of the pulse observed by Dr. Guy; by similar variations in the quantity of urea secreted, this being most abundant in the morning, and diminishing in quantity towards the evening; but more especially by the phenomena of disease, such, for example, as the occurrence of tertian and quartan intermittent fevers. We are therefore inclined to agree with Valentin, who, in his recent work on physiology, remarks:—"our body presents not only a very high degree of symmetry in relation to its structure, but likewise so great an one in respect to time, that many, if not all the vital actions, appear to be subject to a definite periodicity."

An abstract of Dr. Ritchie's interesting researches respecting the exact nature of the corpus luteum is given. A variety of opinions have, it is well known, been entertained as to the seat of the deposit which occurs after the escape of the ovum, and which produces the corpus luteum; whether it be placed within the ruptured Graafian follicle, between its layers, or on its exterior. Dr. Ritchie contends that corpora lutea may be found in each of these situations, and moreover that their aspect and character may vary in a remarkable degree, some (*corpora albida*) being of a white colour, and either of a soft fatty aspect or dense and shining; others (*c. cephaloidea*) are yellowish and of a brain-like character; and another class (*c. rubra*), which are at first similar to the last, although they are plumper, more vascular, better developed, and subsequently the

granular matter of which they are composed, becomes of a decided red colour. Another, but less important class, is also described, consisting merely of the attenuated and ruptured follicle, without any particular matter being deposited. This inquiry is so important, that the following remarks of Dr. Carpenter will not be misplaced.

"The number of cases examined by Dr. Richie is not, perhaps, sufficient to enable us to found any positive statements upon the results of his examination of them; but the following inductions appear highly probable. 1. That the presence of *Corpora Rubra* may he regarded as indicative, not only of conception, but also of an advanced stage of pregnancy, or of recent delivery; but that their absence is not to be regarded as any proof to the contrary.—2. That the presence of *Corpora Cephaloidea* of the second order is to be regarded as indicative of conception.—3. That the presence of the *Corpora Cephaloidea* of the first order, or of *Corpora Albida*, cannot be regarded as in the least degree indicative of Conception; as they may result from the simple discharge of an Ovum, in the ordinary course of those changes to which the Ovarium is subject.—The excess of Corpora Albida above every other appearance is due, not merely to their being an ordinary result of the discharge of unimpregnated Ova; but also to the frequency of their production as degenerated forms (so to speak) of the Corpora Cephaloidea and Corpora Rubra of the gravid female; and also to their occasional existence as, from the first, the only ovarian change following upon Conception." P. 693.

In his account of the ovum the author has omitted to notice that, as it traverses the fallopian tube, a considerable layer of albuminous matter is deposited on the exterior of the zona pellucida or vitelline membrane. This addition accounts for the increase which it has long been known the mammiferous ovum experiences, after it escapes from the ovary; but the observation of Professor Bischoff, for we are indebted to that admirable physiologist for ascertaining the fact, is of higher interest because it tends to show the perfect uniformity which prevails in the formation and development of the ovum among the several classes of the vertebrata. It is known, for example, that the egg, as it passes through the oviduct of oviparous animals, that of the fowl for example, receives the white or albumen, and there can be no doubt that the deposit just alluded to is the analogous substance, derived from the highly organized mucous surface of the fallopian tube, or oviduct of the mammal.

A circumstance which has given rise both in this country and on the Continent to much speculation, relates to the proportional numbers of male and female births. It is well known that the former considerably exceed the latter, so that, "taking the average of the whole of Europe, the proportion is about 106 males to 100 females." There are, however, certain remarkable modifications of this law, and amongst others it has been observed, in illegitimate births, that in some places the males are to the female infants only as 102½ to 100. The cause of this difference has been variously explained. Dr. Carpenter thinks—

"This is probably to be accounted for by the fact, which is one of the most remarkable contributions that have yet been made by Statistics to Physiology, that the Sex of the offspring is influenced by the relative *ages* of the parents. The following table expresses the average results obtained by M. Hofacker in Germany, and by Mr. Sadler in Britain; between which it will be seen that there is a manifest correspondence, although both were drawn from a too limited series of observations. The numbers indicate the proportion of Male births to 100 Females, under the several conditions mentioned in the first column.

	Hofacker.		Sadler.
Father younger than Mother	90·6	Father younger than Mother	86·5
Father and Mother of equal age	90·0	Father and Mother of equal age	94·8
Father older by 1 to 6 years	103·4	Father older by 1 to 6 years	103·7
. . 6 to 9	124·7	. . 6 to 11	126·7
. . 9 to 18	143·7	. . 11 to 16	147·7
. . 18 and more	200·0	. . 16 and more	163·2

From this it appears, that the more advanced age of the Male parent has a very decided influence in occasioning a preponderance in the number of Male infants; and, as the state of society generally involves a condition of this kind in regard to marriages, whilst in the case of illegitimate children the same does not hold good, the difference in the proportional number of male births is accounted for." P. 726.

There is, however, good reason to conclude that some other and probably more general causes are operative in this matter, for another great class of births, the *still-born*, present deviations from the usual law as marked as those just quoted. We have been favoured with some interesting observations upon this subject from a gentleman justly celebrated for the extent and accuracy of his statistical knowledge, Mr. Finlaison, the Government Actuary, from which we make the following selection. "We have for many years been of opinion, that the condition of the parents at the moment of conception has a decided influence upon the sex of the infant then called into existence. That the still-born are, in the vast majority of cases, the offspring of affliction is too evident to require illustration. It has long been known that they form 3½ per cent. of the total births, so far as they are known; but if all were known the proportion would be close upon 5 per cent. Now there is no fact more constant than this, that in this class, for every 100 girls there are 140 boys, notwithstanding that in France this proportion falls to 134." In another class, among whom it must be inferred there is deep distress, namely, in the women who are delivered in the Dublin Lying-in-Hospital, the number of boys considerably exceeds the usual average, and the same thing has been ascertained by Mr. Finlaison as regards one of the most suffering of the metropolitan districts, Bethnal-green. If we now turn "to the offspring of pampered wantonness," the contrast is great. It appears from the *Paris Annuaire*, that the number of disowned natural children amounted in five years to 17,409 boys and 17,117 girls, the sexes thus approaching to an equality. The deductions of Mr. Finlaison would indicate that, whenever the misery of a population, usually determined by the want of sufficient food, reaches a certain pitch, the number of females born, which must subsequently determine the progress of population, diminishes, and thus the evil resulting from an excess of inhabitants in any country ultimately corrects itself.

We here conclude our notice of Dr. Carpenter's work, which we commend to the careful perusal of our readers, containing as it does a comprehensive, lucid, and philosophical exposition of the existing knowledge of this most interesting and important science.

Observations on Aneurism, selected from the Works of the principal Writers on that Disease from the earliest Periods to the Close of the last Century. Translated and Edited by *John E. Erichsen*, Lecturer on General Anatomy and Physiology at the Westminster Hospital. London, 1844. 8vo. pp. 524. Printed for the Sydenham Society.

We cannot much congratulate the Members of the Sydenham Society on the selection which their Council has made upon the present occasion. That a volume, consisting chiefly of memoirs, and extracts from memoirs, of the old surgical writers on a subject, that was so imperfectly and inaccurately understood by them as aneurism, should have been chosen—while so very few classic works of medical literature have yet appeared from their press—has surprised and disappointed us not a little. How is it that we hear nothing of a new edition of the writings of Harvey for example, or of Morgagni, or of Boerhaave—not to make any mention of those of Hippocrates and the fathers of our science—being even under the consideration of the managing Committee?

It can serve little good to collect together the opinions of writers on a disease which it was utterly impossible for them to have any correct notions upon, while the cardinal fact of the circulation of the blood was yet unknown. Such at least is the opinion that we have come to, after a careful perusal of the present volume. No one will be so hardy, we should think, as to dispute the immeasurable superiority of modern over ancient surgery. The one is a science, the other was (on too many occasions) a rude and barbarous art. It could not be otherwise; while so many of the very elementary truths of Physiology were yet unknown, and Pathological Anatomy had not so much as received a name. Not so with Medicine—using this term in contradistinction to Surgery. The course and progress of very many diseases may be accurately portrayed; their origin and causes may be traced out; the various circumstances that affect and modify their symptoms may be detected; and the influence of external agencies and of remedial means may be carefully watched and faithfully described, although the physician is most imperfectly acquainted with the structure of the body. But it is very different with surgical maladies, and more especially with those that may require a cutting operation for their cure. By these remarks we do not mean to find the very slightest fault with the manner in which Mr. Erichsen has discharged the task committed to his care. He has done all for the subject that it admitted of. We only regret that his industry and scholarship have not been applied to the investigation of another theme. His volume will be useful to the surgical antiquarian, as the "Bibliography," appended to it, "contains a reference to all memoirs and detached essays of any value that have been published on the subject of Aneurism within the period to which the work is confined"—from the time of Galen, who wrote in the second century, down to the closing year of the last one.

In the following article, we purpose to direct our attention (and we hope

that of our readers also) more particularly to a notice of the operations introduced and first practised by Anel and by John Hunter, with the view of shewing how deeply the science of surgery is indebted, on this score alone (not to mention others,) to our great countryman. It may add to the interest of the enquiry to take a very brief review of the opinions that were held, as to the nature and treatment of the disease under consideration, by the leading surgeons anterior to the time of Anel, and by those also who lived between his time and that of Hunter.

Galen informs us that "an aneurism is a dilatation or relaxation of a venous vessel, or a dispersion of the spirituous matter under the flesh, where it diffuses and distributes itself by jerks (per dissultationem.)"

Aëtius, three or four centuries later, describes the disease in these words:

"A dilatation of the vessels, which the Greeks call an aneurism, may occur in any part of the body, but it is most frequently met with in the throat, where it gives rise to a tumour that goes by the name of bronchocele. It very commonly happens to women during parturition, on account of the forcible detention of the spirits." 4.

Skipping over only a thousand years, or thereabouts, we come to the time of Fernelius, who wrote a work *de Morbis Universalibus et Particularibus*. According to him, (A. D. 1542) "an Aneurism is the dilatation of an artery full of spirituous blood." Paré, the pride of French surgery in his day (1582), was of opinion that the disease "is occasioned by the blood and spirits being effused under the flesh." Sennertus (1628) seems to have had more correct views as to the nature of the disease. "It is not to be supposed," says he, "that an Aneurism is occasioned by a dilatation of both coats of an artery, but probably of one only: for arteries possess a double coat; an external one, which is thin, fine, and soft, having many straight fibres, but few oblique, and no transverse ones; and an internal one, which is thick, dense, and hard, having transverse, but no straight or oblique, fibres. And therefore if the internal hard membrane be either ruptured, in consequence of over-stretching, or be opened by a wound, it will not, on account of its hardness, coalesce readily; but as the external one is softer, it readily coalesces; and because it is softer, and has neither oblique nor transverse fibres, it will be distended by the blood and vital spirits which are urgently seeking to escape; and thus this kind of tumour is formed, in which the impetus of the blood and of the vital spirit can actually be seen."

This writer subsequently remarks with singular sagacity, that "the proximate cause of an Aneurism is an opening in the internal tunic, and a dilatation of the external one." Wiseman (1676) combated this opinion of Sennertus, contending that the disease was invariably produced by "the blood bursting quite through the artery into the interstices of the muscles." Among the inducing causes, he enumerates an acrimonious state of the blood itself, "which being too sharp or thin, erodes the vessel; or, being highly fermented by other causes, bursts through all."

Upwards of 60 pages are devoted by Mr. Erichsen to the observations of Lancisi—*de aneurysmatibus opus posthumum, Romæ*, 1728. We have been unable to detect a single useful remark among them all. Not a few of his cases of aneurism are merely examples of nervous palpitation of some of the large blood-vessels; and, indeed, one of the sections is

headed, "on aneurisms that are occasioned by an ichorous eroding principle in hypochondriacal, scorbutic, and hysterical persons." He subsequently remarks, that "all chemists agree in this, that aneurisms may very readily be occasioned by mercurial inunctions. Thus Paré, Ballonius, and others have indubitably proved it to us by the examples they have adduced."

Many cases of aneurism were supposed to be owing to the syphilitic disease; but the most frequent cause (according to Lancisi) is excess in eating and drinking—the blood becoming thereby not only redundant in quantity, but also of an acrid and irritating nature. One of his observations really does deserve notice from its practical importance. "A knowledge of these is especially necessary, not only because aneurism of the cavities and of the vessels of the heart is a more common disease than the majority of medical men have hitherto thought, on account of the small number of dissections performed by them, but more particularly because the hidden causes of many diseases are to be found in a dilatation or obstruction of the cavities of the heart. For, indeed, frequent dissections have proved to me that many suffocating asthmatic affections, obstinate oppressions, and frequent palpitations about the heart, dropsy of the chest, and more especially sudden deaths, depend upon one cause, namely, unequal and sudden dilatation of the vessels of the heart."

Let us now briefly notice the treatment of the disease that was adopted by the writers whom we have quoted. Aëtius (in the sixth century) recommended, in brachial aneurisms, that the brachial artery be exposed about the middle of the arm, tied with two ligatures, and divided midway between them. The aneurismal sac was then to be laid open and emptied of its contents; after which, the artery, whence the blood flowed, was to be sought for, tied, and cut across.

Paulus Ægineta seems not to have laid open the sac at all. The description of his operation runs thus. After the vessel has been exposed, "a needle being then passed under it, the artery is to be tied with a double ligature, having previously been punctured in the mindle; suppuration must then be promoted until the ligatures fall out. But if the aneurism is occasioned by the rupture of the artery, all that can be done is to take it up, together with the skin, between the fingers, and then to pass a needle, armed with a double thread, below the part that is to be included in the ligature. After the needle has been passed through, the noose of the string is to be cut off with a pair of scissors, and thus the tumour, being included between two ligatures, is to be tied on both sides like a staphyloma."

Paré gives the following judicious advice:—

> "I would advise the young surgeon not to open aneurisms, provided they be not very small, and situated in parts that are not very important; in which case he may divide the skin above them, and, separating the artery, pass a seton-needle armed with a strong thread under it, and allow the ligature to fall of itself. Nature will then generate flesh, which will block up the artery." 185.

It does not however appear that either he or any of his cotemporaries followed this plan in their practice. Some used compression; others the actual cautery; and, if a cutting operation was resorted to, this consisted in laying open the aneurismal sac (a tourniquet having previously been

applied,) clearing out its contents, and then endeavouring to tie its upper end. As we might expect, the patient generally died either from hæmorrhage, or from gangrene of the limb supervening.

The following extract from the writings of Morel (1681) is curious from the allusion to the *then* high state of surgery:—

"Since the successful employment of ligatures of the vessels in amputation of the members has been generally recognized, most authors have advised the same practice in the operation for aneurism; but with this reserve, that they have considered it useless, or even dangerous, for the large arteries; which has so intimidated many surgeons, that even at present, when surgery appears to have attained the very summit of perfection, many of the most celebrated have abandoned the ligature for a button of vitriol, for the graduated compress, for the constant application of the finger, or for some similar means." 204.

We pass on to the year 1710, when Anel performed his operation of tying the brachial artery, immediately above the aneurismal swelling, without opening its cavity, or in any way interfering with it. The patient, it would seem, was in imminent danger of death from hæmorrhage. As this case may certainly be regarded as unquestionably the most interesting one in the history of the treatment of aneurisms, prior to the time of John Hunter, it may be interesting to mention briefly some of the particulars connected with it. The operation was performed at Rome, on the 30th of January, 1710. The following is Anel's own description of the mode in which it was performed.

"Having made myself master of the blood by means of a tourniquet, I made an incision in the integuments without touching, in any way, the aneurismal sac; I then sought for the artery, which I found situated below the nerve, which is not common. I took every precaution in separating it from this, and having lifted it upon a hook, I ligatured it as near to the tumour as possible. The artery having been tied, I loosened the tourniquet; when a small muscular branch, which I had divided in dissecting the vessel, bled, and compelled me immediately to tighten the tourniquet and to tie the artery again a little higher up. The tourniquet being loosened, I saw no more bleeding, nor any pulsation in the tumour. I then applied the proper dressings and a bandage." 220.

The patient was bled from the other arm on the day of the operation, and the venæsection was repeated three times during the after treatment. On the following morning, a distinct pulse was felt in the wrist of the aneurismatic arm—a circumstance, says M. Anel, "which gave me ground to hope, seeing myself so well seconded by nature, which in a single night had made a new channel by which the blood was conveyed from the arm to the fore-arm, and even to the extremity of the hand.

"Having then no fear of mortification, I devoted the whole of my attention to prevent fever and hæmorrhage. I left the first dressing seventy-two hours without touching it. The third day I dressed the wound with a compound digestive. I also fomented the arm with red wine, to which I added a quarter of camphorated spirits; and only dressed the patient once in the twenty-four hours. By continuing this plan, the cure was happily accomplished without any accident. The first ligature separated on the 17th day of February, 1710; and the second, on the 27th of the same month, without the supervention of the least hæmorrhage. On the 1st of March, in the same year, this friar not only left his room, but went

even to the church of Saint Laurent, in Damasco, which was at the distance of an Italian mile from his convent. On the 5th of March, the wound was perfectly cicatrized. A month after the operation had been performed, the patient used his arm just as before the accident, without the least weakness or pain. The pulsation of the aneurismal tumour disappeared as soon as the artery was tied above it, which ought to happen in accordance with the laws of the circulation of the blood. However, in accordance with the general opinion, this pulsation should have continued; because it is said, that when the operation is performed, the artery should be tied as well below as above, on account of the anastomoses of the branches of the arteries; by which the blood passes into that portion of the trunk that has given way; and that the blood having entered the trunk, refills the tumour, and causes bleeding by returning from below. If all this were true, the pulsation should have continued, and this tumour would not have disappeared unless the ligature had been applied below it; nevertheless, without having done so, the tumour collapsed in such a way that it would have been impossible to have ascertained the spot where the aneurism had existed."

His remarks on the operation are well worthy of notice; they shew that he was far a-head, not only of his contemporaries, but of the next generation also, in the knowledge of the true principles that should guide the surgeon in the treatment of Aneurism.

"With regard to the mode of doing the operation, I performed it in a different way to what authors describe, which I have seen good surgeons adopt, and which I have myself had recourse to several times; for instead, as is customary, of applying the ligature above and below the aneurism, I only practised it above. Besides, the aneurismal sac is usually opened, but I did not touch it at all: not doubting but that the blood contained in it would be dissipated, being at liberty to pass on towards the extremity; that the sac, being once empty would not fill again; that the layers of membrane that formed it would not fail to collapse; and that thus the tumour would disappear: all which happened as I had thought.

"In this way the operation was less tedious, and much less painful; besides, my incision was not half the usual length, hence there was a smaller cicatrix. If I had opened the aneurismal sac, and tied it below, the cicatrix could not have been exactly at the bend of the arm, and might have prevented extension being perfectly performed; which I have seen happen to several patients, who have been maimed by this operation, in consequence of the situation and extent of the cicatrix." 223.

Is it not surprising that the judicious practice of Anel was not imitated by others, after they heard of the success that had attended it? But such is the force of prejudice and long-established usage, that few men have the gift of seizing upon an improvement, when it is first proposed. We find indeed that Heister (in 1744) suggests the application of Anel's operation to cases of popliteal aneurism; for we find him saying:—

"Nevertheless, as this operation can be performed on the arm, as the President and many other modern surgeons are well aware of, I do not think it is impracticable in this situation, if it be done in the same way as in the arm. The tourniquet having been adjusted and tightened, and the patient laid prone on the belly, the popliteal artery should be sought for, the parts covering it having been divided, and a thread being passed round the vessel, above the rupture, should be tied so tight, that, on the tourniquet being slacked, no blood may escape

from the seat of disease ; the wound must afterwards be dressed and healed, in the same way as in an aneurism of the arm." 233.

The idea, however, seems never to have been carried into effect, until the time of Dessault ; who, in a case of popliteal aneurism, tied the artery immediately above the tumor, and effected a cure ; although the tumor subsequently gave way, and the patient died several months afterwards, of the consequences of his disease, complicated with caries of the tibia. This was in 1785.

Such little progress had the surgery of the arteries made in the half-century after Anel's operation, that we find Bromfield—who was surgeon to Her Majesty and to St. George's Hospital—uttering the following opinion* :—

"The injecting the parts of dead bodies having discovered that, in particular subjects, the branches sent off from the principal trunks of arteries have, now and then, formed anastomoses with other branches that have gone off lower down ; and from observing, likewise, that after the operation for the aneurism has been performed, where the artery had been unfortunately wounded in blood-letting, that the lateral vessels have become dilated, in time, sufficiently to carry on the circulation in that limb. From these observations the most extravagant propositions have been by some suggested, viz., that the tying of the principal trunks of the arteries of any of the extremities, when wounded, may be done with a *fair prospect* of preserving the limb. I once saw an attempt of this kind in a true aneurism, situated in the ham, on which I shall make no further remark than that the patient died ; and I dare believe that the embarrassments which occurred, as well as accidents in the operation, will deter the operator from making a second attempt, should a similar case offer for his assistance." 348.

Six years later, the celebrated Pott, in his Remarks on the necessity and propriety of Amputation in certain cases, expressly tells us that the operation then employed for the treatment of popliteal Aneurism was almost always unsuccessful, and uses these remarkable words : "Nor have I ever seen any other operation than that of amputation which has preserved the life of the patient."

In the same year, Wilmer writes thus† :—

"With regard to the case of which we are now speaking, (the aneurism of the popliteal artery,) there is not, that I know, a single case upon record, where the operation for the aneurism hath succeeded. It hath been done several times within these few years, in our public hospitals, but I have not heard of any one case where it answered the intended purpose." 358.

Murray‡ is the first that we find alluding to any experiments on animals, with the view of ascertaining the effects of tying the femoral artery.

"The experiments of George Martin, of Gooch, and of Revans, on a dog, whose femoral artery was tied in the middle of its course, together with the vein and nerve, the animal being perfectly cured by the twelfth day, without the least injury to the limb, confirm me in my opinion that it is so decreed throughout the whole of the animal economy, by the admirable goodness and wisdom of the allwise Providence, that the trunks of those arteries that are, on account of their

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* Surgical Observations and Cases. London, 1773, p. 303.

† Cases and Remarks in Surgery, &c. London, 1779.

‡ In Aneurysmata femoris Observationes, &c., &c. Upsaliæ, 1781.

superficial situation, exposed to external violence, have, as it were, a vicarious action with others that are more deeply seated, and which are most closely connected with them. Numerous experiments that have been performed, both in the upper and lower limbs, favour this opinion. Is it then inconsistent to attribute to the thigh that degree of perfection which it certainly requires on account of its great bulk?" 361.

It was in December, 1785, that John Hunter performed the first operation of tying the femoral artery, about the middle of its course, on the inner part of the thigh, for the cure of a popliteal aneurism. He had himself experienced the danger of tying the vessel near the seat of the disease, and justly referred the unsuccess of this operation to the morbid state of the arterial parietes. It was no random guess, but the philosophical deduction from practical observation, that led him to propose the change. How admirably he anticipates the result of the operation is apparent from the following passage in the report published by Sir Everard Home at the time, in the London Medical Journal:—"Mr. Hunter being too much engaged to permit his taking that task upon himself."

"The force of the circulation being thus taken off from the aneurismal sac, the cause of the disease would, in Mr. Hunter's opinion, be removed; and he thought it highly probable that, if the parts were left to themselves, the sac, with the coagulated blood contained in it, might be absorbed, and the whole of the tumor removed by the actions of the animal economy, which would consequently render any opening into the sac unnecessary." 374.

As every thing connected with this operation—the dawn of a better state of things, and the parent-cause of all the brilliant achievements of modern surgery in the treatment of Aneurisms—cannot fail to be interesting, we shall notice a few particulars. No fewer than four ligatures were employed.

"Having disengaged the artery from its lateral connexions by the knife, and from the parts behind it by means of the end of a thin spatula, a double ligature was passed behind it by means of an eyed probe, and the artery tied by both portions of the ligature, but so slightly as only to compress its sides together; a similar application of ligature was made a little lower; and the reason for passing four ligatures was to compress such a length of artery as might make up for the want of tightness, as he chose to avoid great pressure on the vessel at any one part. The ends of the ligatures were carried directly out at the wound, the sides of which were now brought together and supported by sticking plaster and a linen roller, that they might unite by the first intention." 375.

Every thing went on favourably until the ninth day, when there was a considerable discharge of blood from the part where the ligature passed out—the rest of the wound having healed. A tourniquet was applied; the bleeding stopped, and did not return when the compression was removed a few hours afterwards. The head of a roller was now placed upon the wound in the direction of the artery, and over that the tourniquet, which was not tightened more than was thought sufficient to take off the impetus of the blood in that portion of the artery. On the 15th day, some of the ligatures came away. Six weeks after the operation, the patient left the hospital; the tumor in the ham being considerably reduced, and firmer to the touch. On March 8th, the wound, which had cicatrized, broke out again, and the patient returned into the hospital. A month afterwards, some remaining threads came away, and an inflammation ap-

peared on the upper part of the thigh. In May, a small abscess broke at some distance from the old cicatrix. Several small threads were, at different times, discharged at the old sore. In the beginning of July, a piece of ligature, about an inch in length came away. A week afterwards the patient left the hospital, in every respect well: no tumor remained in the ham. He died in the following year from remittent fever, and an opportunity was had of examining the state of the arteries in the leg that had been operated upon: we must afford room for the report of the examination.

No tumor was perceptible by the eye in the ham of the affected limb; but to the touch there was a solid lump or swelling, filling up the hollow between the two condyles of the thigh bone. The arteries and veins having been carefully injected, the following appearances were discovered on dissection:—

"The femoral artery was impervious from the giving off the profunda, as low as the part which was included in the ligature, and at this part there was an ossification, for about an inch and a half along the course of the artery, of an oval form, the run of which was solid, becoming thinner towards the centre, and not bony but only ligamentous; below this part the femoral artery was pervious down to the aneurismal sac, and contained blood, but did not communicate with the sac itself, having become impervious just at the entrance.

"What remained of the aneurismal sac was somewhat larger than a *hen's egg*, but more oblong, and a little flattened, extending along the side of the *artery below* for some way; the blood pressing with greater force in that direction, and distending that part, so as in some measure to give the appearance of a separate bag. The sac was perfectly circumscribed, not having the smallest remains of the lower orifice from the popliteal artery." 382.

A solid coagulum of blood, composed of concentric lamellæ, was found adherent to the inner surface of the aneurismal sac.

Mr. Home, after remarking how correctly Mr. Hunter had predicted, prior to the operation, the effects which tying the vessel above the seat of the disease would induce, proceeds to observe that the important *conclusion* to be drawn from the history of this case is, "that the simply taking off the force of the circulation from the aneurismal artery is sufficient to effect a cure of the disease, or at least to put a stop to its progress, and leave the parts in a state from which the actions of the animal economy are capable of restoring them to a natural one." He adduces, in support of this view, a most interesting case, (that occurred in the practice of Mr. Ford, of Golden Square,) where an aneurismal swelling in the upper part of the thigh was seized with inflammation and threatening mortification.

"While in this state, the pulsation, before very evident in every part of the tumor, was no longer to be felt, nor even in the artery immediately above it, so that the steps preceding mortification had certainly taken place, the blood in the artery above having coagulated And this circumstance was sufficient to prevent the absolute mortification coming on; for the artery above becoming impervious, put a stop to the dilatation of the sac and all its consequences.

"From the time the pulsation stopped, the swelling and inflammation subsided, although exceedingly slowly, and the tumor diminished, becoming more firm and solid, and at the time of writing this paper is very much reduced in size, and to the feel resembles that found in the ham of the patient who is the subject of this paper." 384.

The first surgeon, who seems to have adopted the Hunterian operation, was Mr. Birch of St. Thomas's Hospital. The case was an aneurism of the *femoral* artery, extending within two inches of Poupart's ligamemt, and occupying two-thirds of the thigh. The artery was exposed at about two inches or so below the groin, and two ligatures were passed round it; the lower one only being tied. On the eleventh day after the operation, the aneurismal tumour burst, and discharged serum and grumous blood; the patient died in the course of the evening. On *dissection*, the artery was found to be ulcerated at the seat of the ligature; this had been applied around the vessel at rather less than half an inch below the giving off of the *profunda* branch, and nearly two inches above the upper end of the aneurismal swelling. The integuments over the middle of the swelling were mortified, and the blood within it was fluid and putrescent.

The reader will observe that this was a most unfavourable case to test the value of the new operation; the ligature was applied not only too near the seat of the disease, but also immediately below the giving off of a large branch.

So little did some of the leading surgeons of that day appreciate the importance of Hunter's method, that we find Pott performing the following operation upwards of a twelvemonth after its introduction:—

"The aneurism was in the ham, and the operation was performed by Mr. Pott in the following manner: An incision was made above the tumor, through the integuments, in the direction of the thigh between the two hamstrings, for about five inches in length; he then dissected down to the vessels at the upper end of the incision, which being there deep-seated, it proved both tedious and difficult. Having come down to the vessels, a double ligature was passed, and the two portions tied separately at nearly half an inch distance. The depth of the incision made it difficult for any but the operator, and those immediately assisting him, to see what was included in the ligature, and no doubt was made at the time of its being anything but the artery. The wound was dressed up in the common way.

"The second day after the operation a pulsation was felt in the tumor, which afterwards enlarged so much that Mr. Pott amputated the limb.

"On dissection, the aneurism did not appear to be in the artery which was included in the ligature, but was supposed to be in an anastomosing branch." 384.

A case operated upon by Mr. Lynn of the Westminister Hospital, very nearly after the plan adopted by Hunter, proved perfectly successful. Not so one at St. Thomas's Hospital, under the care of Mr. Cline, where the following clumsy mode of tying an artery was practised:—

"Mr. Cline made a longitudinal incision on the anterior part of the thigh, and laid bare the artery, passed by means of a tin instrument, a double tape, about one inch broad, behind the artery, the two pieces of tape lying one over the other: the piece of tin which conducted the tape was cut off, and a cork, nearly an inch long, was laid upon the artery, and confined to its situation by means of the upper tape, producing in this way a sufficient pressure upon the vessel included between the ligature and cork to stop the circulation, and consequently the pulsation in the tumor in the ham; the other portion of tape was left loose. The intention of securing the artery in this way was to compress the sides of the vessel together, and produce an union without ulceration.

"The patient went on very well, and the ninth day the tapes were removed, and everything seemed to be going on very favourably, when the patient was attacked by a fever (which was supposed to be caught from another patient in the

same ward,) of which he died. Upon examining the state of the limb after death, it was found that ulceration had taken place through the whole extent of the artery included in the tape, and sinuses were formed both upwards and downwards, in the course of the thigh, to some distance." 399.

In Mr. Hunter's second operation, the femoral artery and vein "were included in *one* strong ligature, sufficiently tight to prevent the pulsation in the one, without injuring the coats of the vessels."

The ligature came away on the fourteenth day. In consequence of hæmorrhage from the wound a few days afterwards, the artery was laid bare and tied a little higher up. But the hæmorrhage returned, and the patient died on the sixth day after the second operation, and the twenty-sixth after the first.

In the *third* case, also, only one ligature was employed: it came away on the fourteenth day. The patient recovered perfectly.

In the *fourth* operation, "the vein was not included in the ligature, but in other respects it was similar to the former." The man quite recovered.

The *fifth* case, also, was successful, the artery alone having been included in a single strong ligature.

M. Chopart was the first who adopted the Hunterian method in France (March 1792.) The case proved unsuccessful, the foot and leg becoming gangrenous.

A few days afterwards, M. Deschamps performed the same operation. He made use of two large ligatures, each consisting of a skein of thread. There seems to have been a great deal of bungling on the part of the surgeon in tying the artery. In spite of some mishaps, however, the case ultimately did well, and the patient was perfectly cured.

After relating several other cases, M. Deschamps enters upon a dissertation with regard to the relative merits of the Hunterian operation, and the old one by incision of the sac. The conclusion, to which he arrives, is given in these words:—

> "It follows, from what we have said, that if the facts, especially those that have occurred under our own observation, are not as yet sufficiently numerous to justify us in giving a decided preference in favour of Hunter's operation over that by incision of the sac, yet they are sufficient to authorize the surgeon to have recourse to Hunter's plan, when the circumstances of the case are favourable to success." 467.

We need not say what has been the result of surgical experience during the last half-century. If our great countryman had done nothing else for science, his operation for aneurism alone would have secured him immortality. Many of the modern French writers have enviously claimed for Anel the praise of the operation, and indulge their national pride by calling it Anel's method. Let us hear what their own countrymen Deschamps, in 1797, has written on the subject:—

> "It may be seen, by what I have just stated concerning these different modes of operating for aneurism, that Anel, as well as Guillemeau, employed the ligature above the tumor, but that their operations differed, inasmuch as Anel did not meddle with the tumor itself; and that Hunter's plan differs from Anel's, inasmuch that the latter, as well as Guillemeau, ligatured the vessel *immediately* above the aneurism, whilst Hunter tied it at a *considerable distance above this*. Hunter has employed this plan since 1783, and it appears to be pretty successful in his hands." 418.

AN ESSAY ON THE PHILOSOPHY OF MEDICAL SCIENCE. By *Elisha Bartlett*, M.D. Philadelphia, 1844, 8vo. pp. 310.

THE disposition to eschew hypothesis as a guide for medical practice, and to fall back upon diligent observation, is rapidly augmenting in this country; and we should feel at a loss at the present time to point to any dominant theory assuming the empire over the mind of observers similar to that once possessed by the systems of Darwin, Cullen, or Brown. This is a matter for congratulation; for although almost any system may furnish some useful practical indications, yet the evil it produces by its exclusiveness, and by diverting attention from the true path of inquiry, infinitely preponderates over any resulting benefit. The object of the present Essay is to demonstrate that all Science, properly so called, must have its foundation laid, and in fact consists in, the careful observation of facts, and not in *à priori* or hypothetical reasoning. It is still more important that fanciful hypothesis should not be our guide in medical science than it is in physical science, inasmuch as the practical results of erroneous views are of so much more vital consequence. In the first part of his work, Dr. Bartlett sets forth the characters of true physical science; and in the second, exhibits the precisely similar nature of medical science, as well as some of the obstacles which oppose themselves to its completeness, and to its pursuit. In each of these there is matter that will prove interesting to our readers.

PART I. THE PHILOSOPHY OF PHYSICAL SCIENCE.

The purport of the entire work may be said to be briefly stated in the first proposition advanced by the author, that "*all physical science consists in ascertained facts, or phenomena, or events; with their relations to other facts, or phenomena, or events; the whole classified and arranged.*" The following observations upon the partial apprehension of this statement, even by those who profess to reject all *à priori* reasoning, are deserving of attention.

"I believe, nevertheless, it is true, that there has always been, and that there still is, in the minds of most men, and in those of philosophical thinkers, a somewhat imperfect, or confused, apprehension of its doctrines. I do not think that its truth is seen and felt, as it should be, in the simplicity, the purity, and the absoluteness, which belong to it. The confusion to which I allude, is this. There seems to be a common feeling, that the facts, phenomena, and events, with their relationships, classified and arranged, constitute, not the entire science, to which they belong, but only the *foundation* of the science. There is a feeling that these facts and relations are to be used as elements, out of which the science is to be built up, or constructed, by what is called *inductive reasoning*. The feeling implies, and the avowed doctrine growing out of it, often asserts, that the science *is in this subsequent process of reasoning*, and not in the facts, themselves, and their relationships. We are constantly told that the facts are to be used as *materials*, to be sure; that it is not safe to take for our materials any thing but facts; that they constitute the basis of every science; but, after all this, the

essential condition and constitution of the science is often placed, more in the process of reasoning, as it is called, than in the facts and their relationships. Now what I wish to insist upon is this: that the science *is in the facts and their relationships, classified and arranged, and in nothing else.* The science, thus constituted, is, so far, complete; no proof of inductive reasoning, or of any other reasoning, no act of the mind can add any thing to what has already been done. * * * * * * * Words are things; and I cannot doubt, that much obscurity and confusion would be removed from our conceptions of the nature of the philosophy of science, if this long-abused term, *inductive reasoning*, could be suffered to disappear from the language of science and philosophy; and if, for the indefinite and shadowy ideas, which it so often expresses, or attempts to express, could be substituted those, which are so clearly and obviously contained in the phraseology,—*the classification and arrangement of phenomena and their relationships.*"

As illustrative of this view of the nature of the philosophy of physical science, Dr. Bartlett cites the phenomena of *gravitation*, which, observed and classified, form the science completely, and exclusively of any subsequent process of reasoning.

That a knowledge of these various facts or phenomena, with their relationships, can only be acquired by *observation*, or experience, is admitted in a general way frequently, without a full appreciation of the consequences of such admission. The necessity of each class of phenomena or relationships being separately submitted to this process is not sufficiently allowed, and the possibility of deducing the existence of certain of them from the knowledge of the existence of certain others, is too readily admitted. After giving various illustrations of the independence of these classes of phenomena of each other, as regards the proof of their existence, the author observes:—

"There is another seeming qualification of the doctrine, that I am endeavouring to illustrate, about which it may be requisite to say a few words. It has often been alleged, for instance, that Sir I. Newton inferred, by a process of *à priori* reasoning, the combustibility of the diamond, before such combustibility had been demonstrated by observation. But what did Newton really do in this case? Manifestly this, and nothing more. A relationship had already been noticed between two certain properties or phenomena,—at least in many bodies; to wit, their refractive power and their combustibility. Newton's reasoning, as it is called, consisted, simply, in the suggestion, or conjecture, that this relationship might be absolute and universal; and, if so, that the diamond would prove to be combustible. The only reasoning in the case consisted in the application to new circumstances of an assumed relationship. It has been said of Fresnel, that he 'proved by a most profound mathematical inquiry, *à priori*,' the existence of certain subtle properties of polarized light. But here, again, what did Fresnel really do? He showed, by the agency of his mathematical calculations, that certain relationships of light, assumed or ascertained by observation, in certain conditions, must, if these relationships were true and genuine, exist, also, in all other identical conditions. He showed that, if certain modifications of light, wrought in its properties, by the action of Iceland spar, during its passage through this substance, were dependent upon certain peculiarities in its crystalline structure, then the same modification must be produced in other substances, identical in these peculiarities of structure with the Iceland spar. He applied, merely, and generalized, by means of his calculations, a phenomenon, or relationship of light, already ascertained by direct observation." P. 25.

A *law* or principle of physical science is defined as consisting "*in a*

rigorous and absolute generalization of the facts, phenomena, events, and relationships, by the sum of which, science is constituted; and in nothing else. It is identical with the universitality of a phenomenon, or the invariableness of a relationship." It is this universitality and unchangeableness of the tendency of all substances, left at liberty, to approach each other, that constitutes the law of gravitation. So, too, with the refrangibility of the rays of light, and various other well-ascertained phenomena.

The Nature and Value of Hypothesis.—The author defines hypothesis as "*an attempted explanation, or interpretation of the ascertained phenomena and relationships, constituting science: and it is nothing else. It consists in an assumption, or a supposition, of certain other unascertained and unknown phenomena. It does not constitute an essential element of science. All science is absolutely independent of hypothesis.*" The desire of explaining the nature of the various phenomena which are only partially known and appreciable by us, has possessed the inquiring spirit of man in all times: but its exercise must not be confounded with and considered as part and parcel of science. The various speculations upon the ultimate constitution of matter, even such as have all the plausibilities and probabilities in their favour, as that of the Atomic Theory, are at best but *conjectural*, having numerous incongruities to contend with, and liable to be dissipated as the field of knowledge enlarges: and yet the facts to be explained, and the co-ordination of phenomena remain immutable. Thus, the facts and science of optics remain unchanged, although the Newtonian hypothesis respecting their nature is abandoned by nearly all enquirers.

A supposed use of hypothesis is thus commented upon:—

"There is one very common feeling in regard to these interpretations and explanations, which is, that they render the phenomena, to which they are applied, more intelligible—more easily comprehended and understood than they otherwise would be. It seems to me, that there is some fallacy in this feeling, or at least, that its alleged value is exaggerated. We shall find, I think, on a close examination of the matter, that the difficulty to which I refer, is only changed in the place which it occupies, by these explanations; that it is neither removed, nor very materially diminished by them."

This opinion is illustrated by inquiring as to what extent is the comprehension of the phenomena of gravitation really rendered more easy by Newton's assumption of the intervention of an invisible æther. The explanation is nowise facilitated by the supposed addition of this material but invisible substance, one difficulty only being substituted for another. The same observation applies to the various theories of light, electricity, chemical attraction, &c.

Dr. Bartlett, however, by no means denies that hypotheses, properly employed, may have their great uses.

"Without qualifying, in any degree, the doctrine I have been endeavoring to elucidate, that all science is independent of hypothesis, I am quite willing to admit, that hypothesis has often been of service to science, in suggesting, guiding, and directing its researches. I am willing to go farther than this, as has already been intimated, and to admit, at least the possibility, in some instances, that the researches thus suggested and directed, may lead ultimately to the positive demonstration of the assumed phenomena, constituting the theory. I am willing to

admit with Professor Whewell (the speculative tendencies of whose mind are very evident in all his writings) the great difficulty, perhaps the impossibility, in many cases, of forming any definite conception of phenomena, or reasoning upon them, without resorting to some hypothetical machinery, for the purpose of expressing their nature and relations. But after all, I cannot avoid repeating the conviction, that an undue importance, and a false position, is still very generally assigned to these interpretations. The old and illegitimate usurpation of power by the Ideal Philosophy, in the empire of science, is even yet only partially destroyed; and the reign of Experience, with that divine right, and absolute dominion, which constitute her inalienable prerogatives, has been only partially established. It is important to observe, farther, that the aids and uses, which may really be derived from hypotheses, will in no way be diminished, but increased rather, by assigning to them the subordinate character and station, which they ought always to occupy. If this is done, while their ability to advance the progress of science will not be in any degree lessened, their mischievous tendencies in obscuring its perceptions, and in leading it astray, will be neutralized." 48.

As a makeweight against the authority of Sir John Herschell and Mr. Whewell, the two great advocates for an extended use of hypothesis, the author cites the opinions of Newton and Davy deprecating their undue influence.

Dr. Bartlett furnishes the following definition of a *theory*:—

"Theory is one of two things, according to the manner in which the word has been used. It is either a generalization of phenomena, and relationships, and in this case, identical with a law, or principle, of science; or it is an attempted explanation of phenomena, and relationships, through the intervention of other assumed and unascertained phenomena, and relationships, and, in this case, identical with hypothesis."

Classification of phenomena and their relationships is essential to the constitution of science. Certain groups, possessing identity or similarity, require to be arranged together, in marked contradistinction to others, evincing dissimilarities, and in proportion as this is accomplished is the classification a natural one. All is confusion until this is effected; for the mere heterogeneous accumulation of facts may be an unavoidable preliminary, but it is their due arrangement and classification alone that can be said to constitute science.

Part II. The Philosophy of Medical Science.

If the temptation to pass from the true path of inquiry and deduction proves often too great for the cultivators of physical science, where so much is known, and so many relationships incontrovertibly established; we may believe that, in the investigation of the science of life, in which the facts acquired are so much fewer in number, and their relations to each other far less obvious, the resort to *à priori* reasoning and hypothesis will be of still more frequent occurrence.

"The feeling has been much more common in medical, than in physical science, that although facts and their relations might, indeed, and must constitute the *foundation* of the science, the science still consisted in something more than these facts and relations;—that, *upon* these latter the science itself was to

be somehow built up by that magical and creative process of the mind,—that evil genius of medical science, called, indeed, *induction*, but differing, when stripped of its disguises, in no single function or attribute, from that speculation, the place of which it professed, with promises as loud and pompous as they have proved to be barren and empty, to occupy. The feeling has been, and still is, as much, almost, since the time of Bacon as before,—that the science is in the *inductive* or *reasoning process*, *superadded to the facts and their relations*, more than in these latter themselves. Here, at the commencement of this part of my essay, I wish to enter my protest against this doctrine, in all its forms and modifications. I wish to show, that the science of medicine consists in the *phenomena of life with their relationships classified and arranged*,—WHOLLY, ENTIRELY, ABSOLUTELY. I wish to show that these elements constitute, not the foundation upon which, nor the materials merely with which, the science is to be subsequently constructed, by some recondite and logical process of the reason, —but that they *are* the science, and the whole science, already constructed, and so far completed: and that nothing can be superadded to them, by any act of the mind, which can in any way increase their value, or change their character." 69.

So important do we regard the inculcation of the necessity of the study of facts as the only legitimate foundation of all science, that we have perhaps allowed the author to repeat himself too often in the extracts we have made from his book. We may, however, now state, that we believe he has in some measure raised a phantom for the mere purpose of destroying it, and that a portion of his objections at least are resolvable into a misapprehension of terms. Far be it from us to state that the so-called medical science even of our own day is not disfigured by hasty conclusions and crude hypotheses. That it is so, and must continue to be, until a more laborious system of observation is recognized as essential (which it is however more and more every year) does not admit of doubt: but we are quite at a loss to know how progress is to be effected if the new facts acquired are not to be submitted to the process of *induction*. In what other manner are our principles for the comprehension and treatment of disease to be acquired? In fact, the author, in one proposition of his essay, contradicts the conclusions of another: for, while he repudiates all idea of science being dependent upon induction, he at the same time asserts that the acquisition of facts and phenomena is useless, unless they be submitted to due classification and arrangement. Truly it is so; but this very classification of a large body of facts is but another term for a generalization of them, which generalization is in point of fact the inductive process itself; and no scientific law or principle can possibly be laid down until it has been gone through. The author has had in view the numberless instances of induction from an insufficient number of facts, and the dangerous consequences of reasoning from false analogies: but such perversions as these no-wise justify his indiscriminate and inconsistent condemnation of the process of induction, when legitimately carried out. We recommend to the notice of our readers the most able statement upon this subject we are acquainted with, namely, a Lecture delivered some years since by Dr. Ferguson, upon "*The Method of Induction and its Results on Medical Science.*"*

* Appendix to his Treatise on Puerperal Fever, 1839.

The author dwells at some length upon the following proposition:—"*Each separate class of facts, phenomena, and events, with their relationships, constituting as far as they go, medical science, can be ascertained in only one way; and that is by observation, or experience. They cannot be deduced or inferred, from any other class of facts, phenomena, events, or relationships, by any process of induction or reasoning, independent of observation.*"

The prevalent belief is that so great a connexion exists between the different branches of medical science, that the knowledge of the one infers a knowledge of another; whereas the knowledge of each series of phenomena or relationships can only be derived from direct observation of such series. For our knowledge of *Physiology* is not, as it is so often said to be, dependent upon our knowledge of *Anatomy*, beyond at least some appreciation of the general law of final causes, or the adaptation of means to the end. Thus, although from this we learn the skull is designed as a protective case for the brain, no anatomical knowledge, however minute and elaborate, could inform us of the functions of this latter organ, many of which were attributed, by the old *à priori* physiologists, to various other organs of the economy. So, too, *Pathology* is not founded upon *Physiology*, and a knowledge of the one is not deducible from a knowledge of the other. This statement, so contrary to received opinions, is yet strictly true; and as exemplificatory of it, examine into the phenomena of the most general of all affections—*inflammation*—which are better understood than are those attendant upon many other forms of disease.

"Now, I ask, if any attainable knowledge of the healthy action of the parts, in which this process is seated, could, of itself, have led us to a knowledge of that diseased action of the same parts, constituting inflammation? Is there anything, susceptible of being ascertained, in the natural functions of these parts, in the properties, the susceptibilities, the actions of the minute arteries, the minute veins, of the capillaries, of the nervous filaments involved in this morbid process, which could have pre-supposed their liability to this process? Could any knowledge of the former have led, by any course or method of reasoning, independent of observation, to a knowledge, or a prediction, of the latter? Could a knowledge of the one have been *deduced* from a knowledge of the other? Most clearly and indisputably not. * * * * * * Do the natural, the unfelt, the unnoticed actions of these minute vessels and nervous filaments pre-suppose, in any way, their liability to those numerous and complex processes—the contractions and distensions of the vessels—the increased, the diminished, the irregular velocity of the blood—the pain, the heat, the secretions—which enter as elements into this morbid condition? Certainly not. What physiological properties of these minute vessels could have informed us of their power, under any circumstances, to separate the fibrine from the other proximate constituents of the blood, or to secrete pus? Certainly none. So far, then, as the phenomena themselves of inflammation are concerned, I do not see how it is possible, that they should be inferred or deduced from the physiological phenomena of the parts with which they are concerned, or in which they are seated: and I think that an examination of all the other circumstances connected with this morbid condition will serve to elucidate and to strengthen this result. Let us take one of these circumstances,—that of the different degree of liability, in the different organs and tissues of the body, to be affected by this morbid process. This difference is very great. Certain parts and organs are very liable to inflammation; other parts and organs are very little so. Now, is there anything in the physiology of these several parts and organs, from which,

by any *à priori* reasoning, these different degrees of liability could have been ascertained? Why are the lungs so frequently, and why is the spleen so rarely, the seat of this pathological process? Why is acute inflammation of the pleura, and the pia mater so common, and acute inflammation of the peritoneum, so uncommon an affection? It will not do to say that these different degrees of liability to this disease can be accounted for by any obvious or appreciable differences in the structure and functions of the organs or tisues in which it is seated. These differences between the peritoneum and the pleura, for instance, are not sufficiently striking to account for the result. Neither will it do to say, as has often been said, that the degree of this liability is in proportion to the importance and functional activity of the different organs and tissues. Let us test the value of this pretended explanation, by a reference to the mucous membrane of the *stomach*. It would be difficult, I think, to find any part of the body, in which, from mere *à priori* reasoning, we should be justified in looking for acute inflammation more frequently than in this. In what part is there greater activity of function? In what part are more important processes carried on? In what part is there a quicker or more delicate susceptibility to impressions? What part is more intimately connected with the other important acts and organs of the body? Is it not the great centre of the organic sympathies? What part is more exposed to the action of irritating substances? And yet, notwithstanding all these apparent, and *à priori* causes of acute inflammation, very few tissues, or organs, of the system are so rarely affected by this morbid process as the mucous membrane of the stomach. Certainly, nothing can show more clearly the utter futility of the attempt to explain the fact of which I am speaking, by referring it to differences in the importance and activity of the functions of the different organs, than this striking exemption of the gastric mucous tissue from attacks of acute inflammation." 96.

The same conclusions are deducible from the examination of the phenomena of any other disease; and the only sense in which anatomical and physiological knowledge may be said to be necessary for the recognition of pathological change, is as serving as a *standard of comparison.*

In like manner, *Etiology* is not deducible from our knowledge of pathology, but from observation alone. Independently of observation, how could pathology, for example, inform us of the influence of age, sex, season, &c., in inducing various forms of disease.

The only solid foundation of *Therapeutics* is also a similar course of independent observation. Writers upon this subject have long been divided into two sects, the *Rationalists* and the *Empirics.* The former profess to derive certain indications for the employment of curative means from the pathological condition of the organ affected, and to offer a satisfactory account of the *modus operandi* of these. The empirics, on the contrary fall back upon experience and observation, and deny that pathology could ever have alone indicated the means requisite for the control of the various morbid phenomena. To revert to the illustration before advanced; how could the treatment of *inflammation* be deduced from a mere *à priori* consideration of its pathology? for, although in some cases the increased heat might seem at once to suggest the application of cold, and the turgidity of vessels the removal of blood, experience alone could have decided whether these conjectures would prove valid; and has decided, that in numerous cases, their indiscriminate carrying out, under circumstances wherein the apparent pathological condition was the same, would prove mischievous or destructive.

"How could any such reasoning have ever led to the conclusion, that the abstraction of blood from the general circulation would have diminished the intensity or shortened the duration, or in any way changed the action of this local morbid process? How could any such reasoning have led to a knowledge of the circumstances, in which this abstraction of blood would be followed by beneficial results? How could any such reasoning have led to the knowledge of the relationship which exists between inflammation and the operation of calomel, antimony, and opium? Could the effects of these substances have been deduced, or inferred, from any knowledge, however accurate, of the phenomena of inflammation?" 112.

Then, again, how could the curative power of arsenic or cinchona in periodic disease have ever been ascertained by other mode than empirical observation; and so on with a whole train of remedies which could never have been suggested by the consideration of pathological conditions alone. Neither can the action of remedies in a diseased state of the economy be inferred from the effects they produce upon it in a state of health; nor can effects which have been produced by these in one class of animals be inferred as certain to occur in animals of another class. Slight analogies may in both cases be suggestive of experiment; but it is by the result of the experiment, and not the probability of the analogy, we must abide.

Diagnosis.—Diagnosis is perfect, just in proportion to the perfection of our pathological knowledge; and is the most important element in every therapeutical operation.

"Therapeutics consist in the relationships which exist between pathological conditions and actions, on the one hand, and the articles and agents of the materia medica, on the other. These relationships, like all others, are fixed and invariable. The properties of the articles and agents of the materia medica are easily ascertained. It is not from the difficulty of ascertaining these properties, that the uncertainties of therapeutics arise. These uncertainties grow out of, and rest in, the imperfection of our diagnosis; the incompleteness of our knowledge of pathology. Just in proportion to the perfection and absoluteness of our diagnosis; just in proportion to the completeness of our pathological knowledge, will be the certainty of our therapeutics. All practical medicine depends upon a knowledge of three things, to wit, pathology; the articles or agents of the materia medica; and the relations between these two elements; and nearly all the difficulties, the obscurities, the uncertainties, the imperfections of practical medicine, grow out of the difficulties, the obscurities, the uncertainties, the imperfections of our pathological knowledge, or, in other words, of our diagnosis." 121.

Dr. Bartlett contrasts the different measure of success which attends our therapeutical procedures in *pleurisy*, in which diagnosis is comparatively so easy and so perfect, with that attendant upon the treatment of the complicated, and often obscure, pathological conditions, constituting typhoid fever.

Diagnosis may be either *nosological* or *therapeutical*. The former of these is that to which the term is usually restricted; and by its aid the different morbid processes are recognized and separated, constituting the various diseases. *Therapeutical* diagnosis is defined by Dr. Bartlett as the distinction between individual diseases, dependent upon their relations to the various agencies of the materia medica.

"The first condition of therapeutical diagnosis is a knowledge of the individual disease; but many other, and frequently much more important, condi-

tions of this diagnosis, are to be found in other circumstances. Amongst these may be mentioned, for the purpose of illustrating my meaning, the following :—the extent and severity of the individual disease—its period—in many cases, its occurrence in a sporadic or an epidemic form—the age of the patient—and the general condition of the patient previous to the attack of the individual disease. These circumstances do not enter into our nosological diagnosis; but they frequently constitute altogether the most important elements in the therapeutical relationships of disease. The nosological diagnosis of acute pneumonia, confined to the lower portion of a single lung, does not differ from that of the same disease, involving the whole of one lung, and the half of the other. But this difference in the extent of the disease will affect very essentially its therapeutical relationships, and the diagnosis depending upon these." 145.

Laws or Principles of Medical Science.—While the laws of physical science are *positive* and absolute, those of the science of life are *approximative* only. The relationships of the phenomena in the former may be analysed or separated and ascertained, while in the latter they are too numerous and complicated to admit of any such process. "The sum of the phenomena and relationships in any and in every given instance is not *constant* and *positive*, but *contingent* and *variable*." Such variableness has however certain fixed limits, within which the law becomes absolute. Unless this were the case, medical science could not be said to exist.

"There is, for instance, a certain number of phenomena and relationships, the sum of which constitutes a disease, to which we give the name of *pleurisy*. This sum or aggregate is not absolute, and uniform, but contingent and variable. No one of these aggregates, constituting the disease, is ever exactly equivalent to another; no two cases of pleurisy are ever precisely identical. Still, the differences between them are not unlimited and indefinite: they are always confined within certain degrees. The resemblances between these individual aggregates are sufficiently fixed and positive, to render them determinate and comparable facts; capable of being used as data, and dealt with in our researches and generalizations, subject to the qualifications already made, as we deal with the data of physical science. The same thing is true of all the other groups of morbid phenomena and relationships, constituting the various individual diseases of the nosology. The sum of these phenomena is more variable and fluctuating in some groups, than in others; our knowledge of these phenomena is more accurate and extensive in some groups, than in others; but the degree of fluctuation is always confined within certain limits, which are susceptible of determinate measurement." 152.

The establishment of a therapeutical or diagnostic principle or law requires, according to the complexity or simpleness of the disease, the observation of a greater or less number of examples. Dr. Bartlett refers, with much satisfaction, to M. *Gavarret's* work on *Medical Statistics*, for a full view of the conditions which it is requisite should be observed, in order that the therapeutical indications deduced from observation, and recorded by numeration, may be trustworthy. Among these are, (1,) the necessity of the facts being sufficiently definite to be *comparable*, e. g. in regard to locality, class of persons, hygienic circumstances, &c.: (2,) the clearness and positiveness of the diagnosis, and recognition of the important varieties of the affection. In testing modes of treatment, there must not be a *selection* of cases, but the plan must be tried in all that present themselves, distinguishing however the varieties of the disease with the

appropriate modifications of treatment; (3,) the method of treatment must be defined distinctly and clearly; (4,) a principle of treatment can only be deduced from the careful analysis of a *great number* of individual instances, and by an application to the average result of the calculation of probabilities. For want of rigorous attention to all these circumstances, which render cases of disease justly *comparable*, so many instances of opposing therapeutical conclusions, and imaginary cures, are constantly brought before the profession and public.

Advocating as he does the great importance of the numerical method of observation, the author is quite aware of the impossibility of its too rigid application in practice. He says—

"How definitively soever the laws of these phenomena and of these relationships may be settled; the individual instances, or elements, of which they are composed, must still continue fluctuating and indeterminate—always, however, within certain limits—the positiveness of the law cannot apply to the individual instances. The exactness of our appreciation of these instances, and our ability to estimate their precise value and conditions, may be aided by an acquaintance with the law; but this appreciation and estimate must still depend mostly upon the extent and accuracy of our knowledge of the several elements, which unite to make up the individual instances themselves. Thus, although the ascertained law of the ratio of mortality in a given disease, under given circumstances, may assist us *in* predicting the termination in an individual case; still this prediction must *depend in* a great degree, upon our knowledge of the fluctuating and variable elements of the case itself. No acquaintance, however perfect, with the laws of pathology and therapeutics, can ever remove, or in any degree diminish, the necessity of a thorough and discriminating study and knowledge of the single instances which unite to make up the materials of the law. Our diagnosis, prognosis, and management of individual cases of disease must depend, not so much upon the laws with which the diseases are concerned, as upon an accurate knowledge of the individual cases themselves; so that no perfection, or absoluteness of the law, can ever lessen the necessity and importance of sagacity, discrimination, and skill, on the part of the physician, in the practical application of his art." 177.

Medical Doctrines or Hypotheses.—The tenour of the observations we have hitherto extracted will prepare the reader to expect the antipathy with which the author regards the various doctrines which have from time to time swayed the medical world. Any praise which may attach to physical hypotheses as guiding and suggesting research, cannot be bestowed upon these, which have only acted as unmitigated evils, retarding progress, mystifying that which was obscure, and preventing the employment of many useful practical procedures. The hypotheses in physical science are few and fair to behold, but in the science of life, "they are without number; their name is legion; and in most instances they are as remarkable for their complexity, clumsiness, and improbability, as the theories of physical science are for the opposite qualities." Sometimes also they do not seem to possess even the merit of having been framed for the better interpretation of disease, but are the mere results of a disordered imagination. The evil influences these doctrines generate are numerous. They incapacitate a man as a faithful *observer* of disease, and disqualify him as a useful practitioner, swayed as he is by pre-conceived notions, derived from an imaginary pathology. Even where the hypothesis has been founded upon

an observation of the effect of remedies, it has often produced an injurious reaction on the subsequent treatment, as may be observed even in the case of Sydenham himself. It is fortunate that the great body of practitioners has seldom allowed itself to be influenced by hypotheses in its treatment of disease, such influence having been usually confined to their speculative originators and a few zealous followers. Not only do hypotheses exert an ill effect upon the practice of medicine, but they impede its scientific advance, precisely as did the false philosophy impede the march of physical science. Nevertheless the use of theory or hypotheses need not be utterly exploded, provided it be received as mere conjecture and not as an element of science. "One of the finest modern instances that I have met with, of the legitimate and admissible use of hypothesis and of the exact appreciation and estimate of its true function and position, is to be found in Dr. Holland's remarks 'On the hypothesis of insect life, as a cause of disease.'"

The various "medical doctrines" as Methodism, Cullenism, Brownism, Broussaism, are briefly adverted to and condemned: but the *coup de grace* is inflicted upon hypothesis in an examination of *Homœopathy*, the claims, of which to the rank of a system, Dr. Bartlett maintains, are equal to any of these, as far as legitimate foundation is concerned, although they have been more mixed up with charlatanism. The author's compatriots are treated with no gentler hand than the European speculators, for we have a chapter devoted to the exposure of the errors of Rush-ism, Cooke-ism, Gallup-ism, and Thomson-ism.

We must extract his remarks upon *Broussais*. After observing, that pre-occupation by hypothesis disqualifies the mind for accurate observation, he goes on to say:—

"I have just mentioned Broussais; and I may add, that nowhere can a more striking exemplification of the influence of which I am speaking, be found, than in the history of his mind. His two great works are the *History of Chronic Inflammations*, and the *Examination of Medical Doctrines*. The former is almost entirely a work of pure observation. The clear-headed, sagacious observer, shines out in every one of its pages: they are all luminous with practical wisdom. I am sure that no man at all capable of appreciating it, can read this book, especially the first parts of it, treating of diseases of the lung and pleura, without feeling, that it proceeded from a mind of extraordinary capacity and strength; and without entire reliance on the accuracy and good faith of the author, as an observer. What precision and positiveness in his diagnosis! What enlarged, but cautious comprehensiveness in his general conclusions! What honesty and frankness in his admission of the frequent impotency of medical art! What admirable tact and discrimination in his selection and use of remedial measures! How clear and sound the philosophy which illumines and binds all this together! How true his appreciation of the emptiness and worthlessness of theoretical speculations; equal almost to that of Newton and Davy! * * * * * * * * * But in his *Examination of Medical Doctrines*, all this is far otherwise. Broussais had now become an *à priori* medical philosopher: he had framed a creed of *rationalism:* he had established a new doctrine of his own: he was the acknowledged chief of a new party: a single dominant idea had taken possession of his mind. In this work, as in the other, the traces of his great genius are still evident. His greatness he could not put off, if he would: but the scientific rectitude of his mind is no longer present: the clearness of his vision has become obscured: the acute and circumspect observer of dis-

cases, and their relationships, indifferent as to the result of his investigations, provided only, that this result was the expression of the actual truth, is now the interested seeker for certain particular phenomena, *which he wishes to find;* the upright and impartial judge has become the *ex parte* advocate and witness. And, as generally happens in similar circumstances, not only is his mind perverted by the influences of a false philosophy, but his passions are excited by the controversies which grow out of it. His arrogance and dogmatism are as offensive as his criticisms of those who refuse to follow him are injurious and unjust. The exigencies of his own creed led him into inconsistencies, and his contradictions of himself are as direct and flagrant, as they are humiliating. He has himself become an illustration of the reasonableness and propriety of one of his own sayings:—'I hold it as a principle always to suspect the experience of a man whose mind is pre-occupied.' He remarks of Lord Bacon, that he often sacrificed at the altar of one of the idols which he had overthrown. And he too, it may be more truly said, redoubtable iconoclast as he is, has set up as false an idol as any which he has broken: and declared a vindictive and uncompromising warfare against all who refuse to fall down before it. And such are the natural, and almost inevitable results of a belief in any of those *à priori* systems." 210.

Classification of Diseases.—The author thus states his proposition upon this subject. "*Diseases, like all other objects of natural history, are susceptible of classification and arrangement, which will be natural and perfect, just in proportion to the number, the importance, and the degree of the similarities and the dissimilarities between the diseases themselves.*" The fundamental error which vitiates all existing classifications is, that they are founded upon the examination and comparison of only *certain particular and limited portions* of the phenomena and relationships. Generally certain striking symptoms of the disease are selected, omitting others often equally essential, and leaving unnoticed the morbid processes and alterations, which constitute the very diseases themselves. Additional impediments have arisen from the belief that the arrangement of diseases is capable of being as fixed and absolute as that of objects of physical science, thus producing a completely *artificial* system; and from the imperfect knowledge of the nature of many of them which prevailed at the period when these nosologies were constructed. The author proposes a more *natural* system, in which large classes of diseases may arrange themselves, according to their affinities, more or less nearly around certain centres, occupied by "type-species."

"One of the best and purest examples, one of the most perfect models, of such a family, is to be found in the exanthematous fevers. They constitute what may be called the *type family*, amongst these groups. Occupying the central region of this group, we find *small-pox*, *cow-pox*, *chicken-pox*, *measles*, and *scarlet fever*, bound closely together, by numerous and very intimate affinities. They are all marked by the presence of that general morbid condition, designated by the term *fever;* they are characterized, each of them, by the presence of a peculiar cutaneous eruption; they are all self-limited, in duration; they pass through a regular series of processes, or changes, constituting so many distinct periods or stages; each of these diseases is capable of propagating itself, by means of a specific poison, or contagious principle; and finally, they rarely affect the system more than once. At distances, farther and farther removed from this central position, we shall find the disease called *roseola*, *nettle-rash*, *erysipelas*, *plague*, *malignant pustule*, and perhaps some others. These latter possess several of the characters, which belong to the former, but not all of

them; and, as the affinities between them and the *type species* become fewer and feebler, they gradually recede from the central region which these occupy." 260.

Illustrations of similar arrangements into families are brought forward in fevers, inflammations, neuroses, &c.: the object of the author not being to frame a nosology, but to suggest the principles upon which it should be constructed. Of *Definitions* he says:—

"Although an adequate definition of a group, or family may be given in a few words, this is not often the case with a species, or a single member of one of these families. Such a definition must include *all the important and more constant phenomena and relationships* of the disease. It must be a clear and comprehensive enumeration of its elements. The omission of any one of these elements renders the definition, so far, inadequate, and defective."

After devoting a chapter to the consideration of the *relations of the chemical and vital forces*, in which he endeavours to place some curb upon the hastier generalizations of Liebig, the author terminates his work with a review of the *future prospects of medical science*. He considers that the direction the medical mind has taken during the last quarter of a century, holds out cheering prospects of future progress in the right direction. It is true that improvements in the *treatment* of disease have not, during the above-mentioned period, proceeded *pari passu* with our improved knowledge of the *nature* of disease; for the study of therapeutical relations is far more difficult and complex than that of the pathology and diagnosis of disease, and is perfected later than these, which are thus necessary preliminaries. Yet even the treatment of disease has made great advances, and will make yet greater, by reason of the great perfection of accurate *diagnosis* that has been arrived at. It is a matter of congratulation, too, that the employment of *heroic* remedies has become so moderated, and that a proper trust in the restorative powers of Nature is beginning to be felt. The axiom of Chomel that *to do good* is only the second law of therapeutics, the first being *not to do harm*, is fast making its way among us.

In estimating to whom will be due the future advancement of practical medicine, the author takes a brief review of the present position of medical science in France, Britain, and the United States. *France* he considers as justly entitled to the honor of having established the *modern school of medical observation*, with its minute analysis of morbid phenomena, and rejection of *à priori* reasonings. The works of Prost, Broussais, Corvisart, Laennec, Serres, Rostan, Lallemand, Rayer, Martinet, Chomel, Andral, Louis, and a host of other celebrated names, present a galaxy, of which that country may well be proud.

"Since the time of Hippocrates, there has not appeared in any age, or country, a series of cotemporaneous publications, upon similar subjects, at all equal to these in extent, variety, and positive value. There is hardly an important point in pathology upon which they have not shed new light—there is hardly a disease, the diagnosis of which they have not rendered easier and more certain, than it formerly was, while in many cases we are wholly indebted to them for our means of diagnosis: and they have added not a little to the exactitude of our knowledge in regard to some therapeutical processes."

The *British* school of observation commenced with Sydenham, and has undergone little change, having but slighly participated in the great continental movement of our times.

"This school has been marked by some of the strongest and best qualities of the British character—sagacity, shrewdness, and sound common sense. It has been regularly progressive since the time of Sydenham, and has accumulated a vast amount of most excellent practical knowledge. Its therapeutical resources have been more various and extensive, than those of its continental rival; and, if it has done less for the advancement of medicine *as a science*, it can hardly be doubted, I think, that it has accomplished more, as a useful and beneficent art. The principal defects of the British School are its want of comprehensiveness, of rigorous and positive conclusions, and the habit of mixing up, with its observations, reasonings and interpretations altogether hypothetical in their character; and then of regarding these reasonings as more important, more valuable, more essential, to the constitution of science, than the observations upon which they are founded."

Dr. Bartlett admits, however, that these blemishes are not universal, and are in course of disappearing, and states that, although our modern medical observers have been too slow in adopting the rigorous numerical method of Louis (to whom he dedicates his work with a just eulogium,) several of an older date pursued inquiry by means no less exact, as Percival, William Brown, of Edinburgh, Woolcombe, John Cheyne, &c.

The medical mind in the *United States* seems to partake of the characters of that of both Britain and France. Prior to the publication of *Bichat's General Anatomy*, medical opinions were almost exclusively derived from Britain, and nearly every English work of importance has been re-published and extensively read.

"The last 15 years, however, have witnessed a great change in this respect. While our medical relations with Britain are still, as they will always continue to be, numerous and intimate, they are altogether less exclusive than formerly; and they are now probably inferior, in interest, influence, and importance, to those which exist between us and France. Our young men have almost ceased to visit the British capitals, in order to complete their education; and the number of those who have repaired to Paris, for this purpose, for many years past, has been very much greater than has ever been the case with Edinburgh and London. The leading works of Louis were earlier and more widely circulated in this country than in Britain; and the principles of his school and method have taken deeper root here, than there." 306.

We believe the author has somewhat exaggerated both the amount of evil which the indulgence in hypothesis has exerted upon the progress of medical science, and the actual extent of its present influence in practice, especially the latter. So too, as before mentioned, he appears to us to misapprehend or confuse the ordinary acceptation of the process of reasoning by induction; and hence to seem in hostility with a mode of procedure he is really not only not adverse to, but an eloquent and able advocate in favour of. However this may be, we cordially recommend his work to the notice of our readers, as one of the highest utility in its general tendencies.

An Apology for the Nerves, or, their Influence and Importance in Health and Disease. By Sir *George Lefevre*, M.D., late Physician of the British Embassy at the Court of St. Petersburgh, &c., &c., &c. 8vo. pp. 363. London, Longman and Co. 1844.

"The Travelling Physician," now that he is established amongst us, seems resolved to write himself into public notice; and, were he to take a little more trouble in the arrangement and connection of his works, he would bid fair, we think, to attain considerable success in this way. He evidently possesses a good many of the qualities that are necessary for a popular medical writer. He has a lively and quick perception, a considerable fund of agreeable information, and an alert and active mind, that is ever on the search for whatever bears on his subject. With light and nimble wing, he skims the surface of a variety of topics; never rudely brushing his feathers against any impediment in his way, nor encountering, save in the most peaceful collision, another brother of the quill.

The great defect of the present work is the utter want of unity or method in its execution. The imp of confusion seems to have been perched on the pen of the author, whenever he took it into his hand; and we might even fancy that it had more than once maliciously displaced the pages of the manuscript, when the knight had left his *sanctum* to repose. At the end of a chapter, the reader will not unfrequently find himself in uncertainty whether he understands the drift or meaning of his author's reflections; nay, the thought may arise in his mind, has the author himself quite formed his opinion on the subject which he has undertaken to discuss?

There is moreover so much irrelevant matter introduced, and the various topics, that are brought under consideration, are held together by so flimsy a thread of connection, that we have often exclaimed in silence to ourselves, what has all this to do with an "Apology for the Nerves?" But, when we call to mind the motto of the work, *Without a nervous system there is no animal, there can be none; without a circulating one there are myriads*—a dogma, by the bye, the truth of which is merely asserted, and by no means proved—we perceived the train of our author's reasoning that whatever appertains, whether in health or in disease, to a living animal body, must have some relation or another with the *nerves*. Sir George shews his good judgment in never introducing the appellation of his work into the discussion of any of the topics which it treats of. The reader thus forgets the professed object of the volume; and, as he passes over its pages, may naturally suppose that he has got hold of some "Leaves out of a Physician's Scrap-book," or "Random Sketches in Medicine," dashed off with a free and easy pen to amuse a passing hour. That Sir George is capable of something of a higher cast than he has yet essayed, we have no doubt. He has been an observant man of the world; and there is no want of tact or cleverness about him in distinguishing truth from error and in applying his knowledge to practice. He is ever the courteou

polite gentleman to all whom he may chance to mention, avoiding censure where he cannot praise, and always expressing his criticisms in the least presumptuous manner. We should suppose that he was much liked by his *confrères* at Petersburg, and we trust that he will experience from his brethren here the same good feeling that he ever seeks to show to others.

After these remarks, we need scarcely say that, in reviewing such a work as the present, all that we can do is to select such passages as may either instruct by the novelty of their information, or interest by the manner in which this is conveyed; and first of the

Effects of Extreme Cold in Russia.

"I have witnessed the effects of cold too long endured upon the little postillions, who are barbarously exposed to it in the winter season at St. Petersburg. The lads bear it for a time, as they sit on their horses, clapping their hands, and singing to keep up their courage; but this fails them by degrees, and finally benumbed, they fall from their saddles in a state of torpor which nothing but rolling them in the snow will overcome. There is seldom a fete given at St. Petersburg, in the extreme cold weather, that occurrences of this sort are not recorded. In very cold nights the sentries are frequently frozen to death, if not relieved at short intervals.

"As long as nervous excitement can be kept up, the resistance of cold is very great. General Piroffsky informed me, that in the expedition to Khiva, notwithstanding the intenseness of the cold, the soldiers marched along singing, *with the breasts of their coats open*, but only as long as they were flushed with the hopes of success. Where there is nothing to excite, and where exposure to cold takes place under the common routine of parade, its depressing effects are lamentably felt by those long exposed to it. In the time of the Grand Duke Constantine, a regiment of horse was marched from Strelna to St. Petersburg, a distance of twelve miles and upwards. He marched at their head at a foot pace all the way. He had well wadded himself, and smeared his face over with oil. It was the gratification of a whim to expose the soldiers to a great degree of cold. They arrived at the square before the palace, and were dismissed to their barracks. The following day one-third of the regiment was in the hospital, attacked by nervous fever, of which many died. There was no stimulus of necessity in this case, but the moral feeling aggravated the physical suffering. The soldier is much better taken care of now-a-days in Russia. Cerebral affections are a consequence of reaction when the nervous system has been too much exhausted. I have mentioned elsewhere the case of the bishop of Nicolai, who died in a few hours of brain fever, from exposing himself to severe cold during the performance of a religious rite." 21.

Passing over Chapters II. and III. on the Blood, Muscular Motion, Nutrition, and Secretion, we come to the fourth which professes to treat of Sympathy, Phrenology, Mesmerism, Sleep and Dreams—a rather droll concatenation of subjects. The Chapter opens in a pleasant jocular mood, our author being no lover of the dry crumbs of philosophy. When Falstaff said he knew the Prince by instinct, he solved a very difficult problem. We are often in the same predicament, without being able to extricate ourselves so satisfactorily as the worthy knight. Where ideas fail, we can sometimes, as Mephistopheles said to the student, substitute a sonorous word; at other times, ideas are more redundant than our means of expression.

"John Hunter has been criticised for his 'stimulus of necessity,' as an

unmeaning term, yet there is something very instinctively intelligible in the idea it conveys.

"Some physiologists have denied sympathy, but have furnished us with no better word for a multitude of effects, which cannot be otherwise explained than by the use of some conventional term." 48.

The complicated phenomena of Sympathy, or, at least, the laws which regulate them, evidently constitute a subject that Sir George has no pleasure in grappling with. We are amused with the quiet way in which he disposes of the Excito-motory functions, and their clever expositor :—

"Dr. Marshall Hall's view of the sympathies merits due attention, and must be read with great interest: but it is impossible to make works of this kind duly appreciated by a few extracts.

"The whole bears upon every part; but each single part conveys no accurate idea of the whole." 57.

The next topic discussed is—

Phrenology.

Sir George seems to be a hesitating believer in the doctrines not only of Gall and Spurzheim, but of Lavater also. He admits that there is still very great uncertainty as to the locality or material seat of certain faculties and passions, and takes the opportunity of quoting with approbation the shrewd remark of Mr. Travers, that "cerebral regions and cerebral agencies are as indispensable to the production of local physical sensations as to the operations of the mind. The phrenological system, I may here remark, owes its existence to the countenance which it derives from a twilight of truth, though only sufficient to serve as a beacon to the absurdities with which it is enveloped."—*Physiology of Inflammation.*

That the size of the Brain may become increased even in an adult, in consequence of the unusual exercise of the mental powers, is a fact that has been asserted to have been observed in many instances. One of the most remarkable examples is that adduced by a writer in the *Dict. des Sciences Medicales.*—"On peut en citer un exemple, le plus connu qu'on a observé, dans la personne de Napoleon, dont la tête, peu volumineuse dans sa jeunesse, avoit acquis depuis quelques années un development presque enorme."

We have heard a good deal of late, in this metropolis, of the organ of Acquisitiveness in certain ladies gaining an undue ascendency over that of their Conscientiousness and Love of Justice; but we were not aware, till we read the present volume, how endemic the malady has become amongst us. "There are few shop-keepers," says Sir George, "in London, who cannot point out persons of rank who will readily lay out £100; yet if they have an opportunity, will steal a yard of lace!" We hope that things are not quite so bad as this yet!

The following excellent remarks are appended, in the way of comment on a case of *cerebral excitement*, in which the opinion of Spurzheim had been followed with marked advantage :—

"When in Edinburgh, I was clinical clerk to the late Dr. Rutherford, with whose memory are associated most grateful recollections, and from whom I

received most marked kindness. His practice was considered by the students, who know so much, or think they know so much, as puerile and inert, and his visits drew but few followers into the wards. Cases, which semed to us to demand the most active treatment and a free use of the lancet, were treated by a saline diaphoretic mixture and a foot bath, and got well under such treatment. He once said to me, with a smile: my practice differs from that of my colleagues; but it is my object to let the students see how much Nature will do in many instances, and how patients recover under the most simple treatment, and by the removal only of all exciting causes. It is too common with you all to ascribe every thing to the medicines you administer. The very active treatment you employ relieves the symptoms, and you take great credit to yourselves for your decided practice; but you forget that long convalescences follow, and the constitution is shattered and impaired by such abstraction of its powers. You will find that patients who have been apparently cured by large bleedings which have conquered pain in the first instance, remain eventually longer in the wards than those who have not been so speedily relieved; moreover, you will find them return again, after their dismissal, with dropsy and chronic affections. As regarded bleeding, the Doctor never took away more than from eight to twelve ounces at a time; and now, after a period of twenty-five years, his views of things, and those of his colleague, Dr. Gregory, seem to have been correct; for, as the latter has beautifully expressed it, 'Nam ut sanguis semel missus nunquam in venas redit, sic neque vires cum illo amissæ in variis morbis unquam refici possunt.'" 67.

From Phrenology we pass on to—

Mesmerism.

Our author is too acute to believe in any of the mountebankeries—Clairvoyance for example—of this "forlorn thing," as Marshall Hall calls it. He mentions the case of a female impostor at St. Petersburg, who, among other feats, extracted living worms from the points of the fingers! As a matter of course, we have no intention of discussing the merits of the *science*, at present. Suffice it to say that the abstraction or concentration of the attention, on the part of the magnetized person, is sufficient to account for very many of the marvellous phenomena that have been so much talked of. Violent mental emotions will often render the body insensible to suffering. The most agonising tooth-ache generally ceases before the dentist has applied his instruments; a man with a wooden leg has been known to leap over a gate when a mad bull was coming down upon him; a paralytic patient has sprung out of bed on the alarm of his house being on fire; and many a soldier and sailor have looked with incredulous astonishment, at the feats which they had accomplished on the preceding day, during the mad excitement of the battle. We adduce the following case—which came under our author's cognizance—as an instance not of a cure by Mesmerism, but of the ill-effects of medical men (probably) doing too much in certain circumstances:—

"A lady, the wife of a physician, met with the following accident:—Her foot having slipped in mounting the steps to her door, she fell down the area, and concussion of the spine was the consequence. She lost all power of motion in the lower extremities. Various means were resorted to; blisters, setons, frictions, with tartarized antimony, galvanism, and, finally, she suffered the excruciating tortures of seven moxas burnt upon the sacrum, at different periods,—all without effect. She remained a cripple, without any power of moving her

limbs, and this for the space of twelve months. She was carried in a litter to the steam-boat, which took her to Paris by Havre. Upon her arrival there she was treated by Recamier. He introduced a series of setons from the nape of the neck to the sacrum, but with no better effect. She was a woman of great moral courage. *Nil desperandum.* She resolved on trying magnetism. A female treated her, and in six weeks she was going the rounds of a gay Parisian life, with her limbs perfectly restored." 73.

Such instances ought to suggest a useful admonition to medical men against the over officious employment of unpleasant and painful remedies in cases of chronic functional disturbance. In such a case as the preceding, electro-magnetism has been used of late years with very marked benefit.

Passing over our author's remarks on Sleep, Dreams, and the senses of Vision, Hearing, Taste, and Smell, we come to the following remarks, under the head of the sense of Touch, on *the good effects of rubbing the skin!*—

"There is, I believe, a great deal to be done, in a medical sense, by mere rubbing, if well performed. In many instances, it is the best means of soothing, and induces sleep as sure as an opiate. In many female obstructions, constant rubbing with the flesh-brush will do more than steel and myrrh pills; but this must not be trusted to the patient, for then it is never done effectually, either from forgetfulness, fatigue, or the intervention of a hundred other causes. A steady old nurse should perform this operation. In the mesenteric affections of children, the same system is most efficacious. In chronic diarrhœa I have found it most beneficial; and in that half-and-half kind of gout which sometimes makes its appearance, and threatens worse attacks for the future, this will often effect wonders."

* * * * * * * * *

"A Gentleman complained to me, that he had had an attack of the common cholera some months previously, and that his bowels had since been in so disordered a state as to interfere with his pursuits, thus being a source of great annoyance to him, and rendering him irritable. I told him to buy a flesh brush, or a pair of hair gloves, and rub himself night and morning. He told me, some weeks afterwards, that he had found the greatest benefit from the rubbing system.

"It is questionable if the hair shirt of catholic penance might not be useful in some of these chronic cases of diarrhœa." 107.

There is a long and rambling Chapter on *Headaches.* It contains, however, some very shrewd remarks, which our readers may thank us for picking out for their use. In those *nervous* headaches, which are accompanied with excessive irritability of mind, and waywardness of temper—perhaps even with threatenings of mental aberration—Sir George very judiciously recommends the steady use of the shower-bath as one of the best of remedies.

If the attacks of pain be periodic, Arsenic is generally useful. When Quinine is administered, it should be combined with an aperient; "for an open state of the bowels is always a source of relief, although purgatives do but little good, if given alone." The well-known Griffith's Mixture, with a blue pill once or twice a week, produces, in many cases, excellent effects in weak and debilitated habits. Valerian and Hoffman's drops will often give temporary relief.

"In the rheumatic headache we have something more tangible. If we do not succeed in relieving it, we seem to set about the task with more confidence. It is the most painful perhaps of all the kinds, but it is sometimes remediable. It often begins in a point over the eye, or in the temple, and then gains the whole head. A full dose of colchicum at the commencement, will sometimes cut it off, and with this a dose of calomel and opium at night. A lady whom I treated for this affection, was relieved by a mixture of decoction of bark and guaiacum, in equal parts, of which she took a dose three times a day. With her it proved a specific, and she wrote to me for the prescription sometime afterwards from Italy, as she had found nothing else relieve her." 142.

In the Hæmorrhoidal form of the complaint, leeches to the anus are, says our author, a specific. *La tête est degagée* is the expression of all who are thus treated. In the headaches of children, in whom there is any predisposition to Hydrocephalus, the application of cold to the head, frequent blistering behind the ears, or the insertion of a seton in one of the arms, are the most potent of all remedies.

The seventh Chapter is occupied with cursory remarks on many nervous diseases—*Epilepsy*, *Hysteria*, *Palsy*, *Catalepsy*, *Hydrophobia*, *Trismus*, *Delirium Tremens*, *Pertussis*, and *Chorea*. We select the following, as favorable specimens of the general manner in which these subjects are treated:—

Hooping Cough.

"I may here mention the treatment which we find most useful in northern climates. We have not the advantage of changing the air for a long period, so that the complaint is often of formidable duration; but as soon as the febrile stage has subsided, which generally takes place towards the end of the third week, doses of musk seem to have a specific influence. I have seen the most happy effects from its use, both in the general practice of my colleagues, and my own, in St. Petersburg. A grain of musk three or four times a day, will, in general, arrest the most convulsive species of coughing in a few days.

"I have generally in the early stages, experienced great advantage from the application of leeches to the temples; for I believe that there is very often congestion in the brain, and that the latter, if not previously, is often secondarily, affected." 178.

Chorea.

"Dr. Depp, chief physician to the Foundling Hospital in St. Petersburg, acquired a great and deserved reputation for his success in the treatment of this disease.

"His plan was almost wholly confined to the use of the shower-bath at all seasons of the year; and as soon as the weather permitted, he removed his patients into the country, selecting as elevated a position as possible, that they might enjoy the advantages of a bracing atmosphere. He insisted also upon the hair being cut close and the head spunged with cold vinegar and water at several periods during the day; the shower bath to be employed as soon as the patient left the bed, or rather hard mattress, which he also insisted upon. He prescribed few medicines, and nothing usurping the name of a specific. The bowels were to be regulated by the mildest purgatives, but the shower-bath seemed to supercede the necessity of these.

"I saw but few cases of this singular affection, but a very aggravated one was most materially relieved by this treatment." 180.

We cannot answer for the results of medical practice in Russia; but of

this we feel assured, that no judicious medical man in this country will trust to the use of cold bathing for the cure of Chorea. The internal exhibition of steel—and in some cases of Arsenic—is with us very generally necessary.

Chapter VIII. touches lightly upon *Cholera*—*Scorbutus*—*Scurvy* (how comes this to be treated apart from its Latin synonym?) and *Diabetes*—a somewhat incongruous conjunction, and this too in a work that professes to treat of the nerves!

Chapter IX. is devoted to the consideration of *Fevers*, or rather of the ætiological question, Is the primary morbid impression on the blood, or on the nerves, in febrile diseases? Sir George, as we might anticipate, leans to the latter opinion, and quotes a variety of passages from the writings of Billing, Copland, Sir Alex. Crichton, and others in favor of his own views. The following sensible observations, on the predisposing influence of the depressing emotions, may be aptly quoted:—

"The dread of evil is sometimes greater than the evil itself. Of this the Cholera afforded us a good illustration. When it was raging at Moscow, we of the faculty greeted each other in the streets of St. Petersburg with very lengthened faces; but as soon as it came among us, and we plunged in *medias res*, there was no fear apparent. The stimulus of exertion to vie with each other in finding some remedial means, became a buckler to ourselves.

"The fever in Edinburgh, in 1818, to which I have alluded, afforded a very striking evidence of the effects of moral depression upon one individual, who was superintendent of the Queensberry House Fever Hospital. He was the most active man in the institution, and escaped the fever, when all the medical inmates, myself among others, had passed through the ordeal. He seemed proof against its influence. But he wrote a book upon the subject,—a large volume, and embarked all his little means in the speculation. It turned out unfortunately for him, and preyed upon his mind. He took the fever when the wards were almost cleared of it, and though he struggled through it, he died of its consequences.

"I think that such information as the following has saddened the heart of many, upon inquiry after old acquaintances:—'He got wrong in his affairs, was harassed by domestic misfortune, got into a low nervous state, caught cold, which terminated in fever, of which he died.'" 219.

Our author, following in the footsteps of Dr. Macculloch, attributes a great variety of anomalous and indistinctly-marked maladies to the influence of Malaria. What is commonly called *ill-health*—without the specific symptoms of any one disease—may very often, he thinks, be traced to the operation of this cause. This remark is especially applicable to medical practice in the Russian metropolis.

"Situated in a bog, surrounded by marsh and peaty formations on every side, the city of St. Petersburg rises a monument of the triumph of art over nature. It was as great a feat for Peter the Great to erect his capital in such a situation, as for the Roman Emperor to conquer the sea by his bridges. It was determined by the savants in Paris, when they discussed the causes of the *black death*, that if the disease had occurred in Sardinia, not a soul would have been left alive, so much did they attribute to local influence in the creation of that epidemic; and were it not for the hard frosts in winter, malaria would probably destroy the population of St. Petersburg."

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"There are few females in St. Petersburg who are not subject to nervous

headaches. These are, I think, attributable in a great measure to the heat of the rooms and the close air of the apartments, which are useful only as preventatives of phthisis, but are far from conducive to strong health; these affections of the head are accompanied by varieties of uneasy feelings, loss of appetite, sleeplessness, vertigo, and more or less of fever. They are not relieved by country air nor the admission of free air into the houses, nor by the removal of the double windows at this season, because with the circumstances that permit of these operations, others arise. The emanations from the decayed vegetab.e matter which were kept under by a coat of snow and hard frost are now let loose, and it is in the spring season that all these affections are most aggravated. This is the season of the greatest mortality; and the breaking up of the ice and its departure from the Neva, are most dreaded by those who have long been ill. Il s'en ira avec le debâcle, is a phrase in the mouths of all the Mrs. Quicklys in St. Petersburg. It is the turning of the tide with them. To those, however, who are able to get away, it is the speedy return to pristine health. Those who are robust by nature brave this climate with impunity; those whose lives are active, and employments sufficient to occupy their time, enjoy the best of health; but, to the ailing and nervous, it is a species of martyrdom. Hypochondriacs abound, and I have known such quit the country for fear of worse consequences in a mental sense, and return again in a few months to laugh at their own folly." 234.

It would seem, from our author's experience, that the diseases of St. Petersburg—even those of a decidedly inflammatory character—*do not* bear well very copious, or frequently-repeated, depletions of blood. Under the most favorable circumstances, the convalescence from any serious illness is apt to be exceedingly tedious, *there*, more especially during the winter months. To re-establish the health, it is very generally necessary to leave the banks of the Neva for some more healthy locality, on the breaking up of the ice in the Gulf of Finland.

In the treatment of *Agues*, Sir George lays much stress on the importance of administering one or two grains of calomel, for two or three nights successively before, and also during, the use of the bark or quinine. The mercurial seems decidedly to promote the anti-periodic virtues of the latter. The Muriate of Ammonia also has been found by our author a very useful adjuvant in many cases. His formula is this:—

℞ Ammon. muriatis ʒj.
Extract. Taraxaci ℥ss.
Aquæ petroselin. ℥vij. M.
Cujus sumat æger coch. duo ampla ter die.

We need scarcely say, that *Rheumatic* and *Neuralgic* complaints are exceedingly common in St. Petersburg. "Under all circumstances, they are very tedious, and, in general, perfect recovery is not effected till the season of migration arrives."

Chapter XII. professes to give us an account of *Some Peculiarities of German Practice*,—"which," we are informed, "holds a middle rank of action between the French and the English, being more energetic than the former and less so than the latter." We have been much disappointed with this Chapter, as we had quite expected from its title—reasonably too, it will be admitted—to have found on perusal a good deal of interesting and even instructive matter. We select one or two passages that are most worthy of notice:—

Grape Cure.

"Those who have practised long in Russia will have been made conversant with the *cure du raisin*. I had an opportunity of becoming so when in the south of the empire, and in a grape country. It is necessary to state in what this cure consists, and for what class of diseases it is recommended. The latter may be dismissed at once, by stating that all those functional nervous affections, which resist the routine of treatment generally employed, are the cases which may be so benefited, seeing that the discipline is more intolerable than the disorders for which it is instituted. A lady of rank leaves her bed of down and cushioned canopy, and migrates into the country,—turns a poor family out of their habitation (not without making them an ample recompense) and becomes the tenant of a filthy hut. This is part of the cure, viz., to forego all luxury, to sleep in the peasant's crib, to sit upon his bench, and to avoid anything in the shape of comfort. The grape alone for meat—the grape for drink; a small quantity of dry bread is perhaps allowed. This is continued for the space of three weeks, and it is no wonder, if all circumstances are taken into consideration, that a cure is effected. I have known people of the highest rank subject themselves to such discipline, and have full faith in its results. It is homœopathy and hydropathy in another shape, and as the Italians say of all the varieties of form in which they make their pastes, c'est *toujours du macaroni*." 282.

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A New Vesicatory.

"There is an Epispastic much used abroad, which I think would be advantageously introduced into British practice. It is the 'Pommade vegetale de Swisse,' a preparation of the bark of the mezereon, which, when rubbed on the skin, produces immediate vesication, without causing the same irritation, and never accompanied by any of the unpleasant symptoms which are sometimes produced by the blistering fly. It is employed generally to produce vesication behind the ears, and particularly in the affection we are speaking of. A small portion, rubbed strongly in, raises a blister in a few hours, and the surface may be made to discharge for any length of time, by smearing it over with the same preparation. Where a large blister of the lytta has been first applied, this preparation answers much better than the savine ointment in keeping it open. I have not been able to procure it in any of the druggists' or patent medicine shops in this metropolis. In cases threatening hydrocephalus, the Germans apply it behind the ears, and keep one side in a state of exudation for years consecutively, where they do not insert an issue." 143.

On more than one occasion, Sir George states that in his Russian practice, the ordinary *blue pill* did not seem to exercise its usual effects on the system, either in visceral affections or in the venereal disease. In the treatment of the former, calomel, and in that of the latter, the bi-chloride was greatly preferable. It is to be remarked that the *blue pill*, which was used by him, was imported direct from London.

We must here remind Sir George, that an author is not entitled to copy, even from his own writings, without giving some intimation to his readers. Not a few passages in this Chapter are merely reprints of what has already been made known in his "Essay on Thermal Comfort"—published, too, within the last twelve months! But we suppose that we must not press hard upon any one, who gets up new books so quickly as the "Apology" has obviously been.

It only remains to notice the Appendix; and, in doing this, we must confess that we have rarely met with such a *melée* of discordant articles

jumbled together in the most admired confusion. First of all comes one on the Venereal Disease; and this is followed by others on Cancer, the Cæsarian Operation, Nerven-Schlag, Disease of the Kidney, Poisons, Rupture of the Gall-bladder, Puncture of the Intestines, Mesmerism (a second time), Experiments on Animals, Sound, and the *Plica Polonica.* On this last-named subject, we had certainly anticipated to have found something novel and instructive; but the truth is, that Sir George seems to be quite as much puzzled to know what to say about it, as any one who has never crossed the Channel. Hear his droll confession:—"To unfold a plain unvarnished tale, must be left, I believe, to the Ghost of Hamlet; for no one living seems disposed to do it. We find that not only the real existence of the disease is a matter of contention, but its origin and progress are equally twisted, like itself, from the path of truth by those who believe in its existence." All that can be learned from our author is that, in his opinion, it is a critical excretion from the scalp and roots of the hair, and is the natural curative process of a variety of complaints. The lower orders of the Polish population often encourage its formation and continuance,—by keeping the head hot and nasty—in obstinate cases of Ophthalmia, Rheumatic Headache, and so forth. But it is unnecessary to extend our remarks; "as," to use Sir George's own words, "few describe what they themselves have seen, or the results of their own study and observation."

Practical Observations and Suggestions in Medicine. By *Marshall Hall,* M.D., F.R.S., L., and E., &c., &c. 8vo. pp. 360. Churchill. London, 1845.

Few men have been more active and stirring in their generation than the author of the present volume. At an early period of life, he entered the field of authorship; and since the date of his first work, he has continued to keep his name before the public eye by a series of clever and ingenious productions. Of late years more especially, he has been unusually prolific. Since the first announcement of the Doctrine of the Reflex Functions, there has been an almost uninterrupted succession from his pen of papers, memoirs, books, and lectures on the subject. One cause indeed of this "magna copia *scribendi*" is, that Dr. Hall is evidently, by nature as well as by taste, a controversialist. Impatient of contradiction, and with an inordinate appetency for praise, he never lets an opportunity pass of anwering the objections, exposing the errors, and—sometimes too—of impugning the motives of whosoever may differ from him. He is always ready for the combat; and his weapons are keen, and adroitly—although too often uncourteously—handled. Even in the present volume—which, by the bye, is entitled "*Practical* Observations and Suggestions in Medicine"—the captious spirit sometimes oozes out. On one occasion, we read "that those discoveries (in regard to the functions of the spinal marrow) have been continually and very groundlessly called into question and made the subject of dispute, and that by gentlemen totally unprepared

for entering upon that discussion;" and, on another, the whole profession is roundly reproved for having received one of our author's propositions with lukewarmness.

Dr. Hall has most of the characteristic attributes of the out-and-out reformer of fifteen years ago. Quick, clever, censorious, and self-complacent, he is full of himself, and has *his* remedy ready for every difficulty. He is fond of *new-ness* in almost every thing; and so smitten is he with the love of innovation, that many old things he calls *new*. We need not say that the faculty of Veneration is not predominant in his character; and that he has no great respect, on the whole, for long-established opinions and practices. Hence it comes that he has little pleasure in dwelling upon the labours of others, except in so far as they serve to exalt the value of his own: he seldom expatiates at any length upon what has been done before his time; his thoughts are mainly occupied with the doings of himself and of his cotemporaries. He keeps an ever-wakeful eye on everything that is going on around him, and his alert mind is always busy in devising some new change or another. He does not seem to know, or at all events to appreciate, what artists mean by the term "repose." There is a restlessness about him that he cannot subdue; all is stirring and fermenting within and around him. Without the least imputation of vanity, he may very fairly affirm that "*his* has been a really active professional life." It would have been the same whatever had been the station in which he was placed, or the vocation to which he had applied himself. In humble life, he would have raised himself from the ranks to the post of adjutant, or perhaps even to the command of a company; from the toilsome drudgery of a village schoolmaster to the envied distinction of a clever sectarian preacher. The energy of his character is truly admirable; and would command universal respect, if it were not for the over-weening egotism (shall we use a word that he himself has supplied us with?—*ego-mania*) that oft excites a smile, when it does not provoke a sneer: this it is which mars so grievously much that he has done, and done too so well. The first personal pronoun abounds, to a most alarming extent, in all his writings. He cannot wait for others to praise him; so that, every now and then, he is obliged to indulge in a little self-laudation. Not satisfied with telling us—in the retrospective notice of his authorship with which he has favoured us—that he has "allowed few days to elapse without recorded observation," he proceeds to remark, with a most *naïve* complacency, "this habit *I* regard as the *test* of a physician's steadiness and industry." *My* "New Memoir" is characterised as containing "the most lucid and recent view of the whole subject of the Physiology and Pathology of the True Spinal System." But perhaps the most amusing instance of the dominant passion, is, when our author sits down in the critic's chair, and takes upon himself to weigh, in the balance of practical importance, the comparative merits of his own professional labours. First and foremost of all are "*my* researches in regard to the use and abuse of blood-letting:" these, he goes on to say, "*I* look upon with the greatest satisfaction." In a previous publication, he very modestly pronounces the following judgment on his discovery of the effects of blood-letting in the erect posture, as a means of distinguishing inflammatory from irritative disease—a point of practice, by the bye, which has any thing but received

the sanction of the profession. "There is, in *our* opinion, no single fact in physic of equal importance and value, in the diagnosis of acute diseases and the use of an important remedy." We are told, in reference to another of his diagnostic discoveries, "that it is one of great practical importance, and that it has proved the means of saving many dear and valuable lives;" and, after enumerating a few more instances of the benefits which he has done, he sums up his claims to public gratitude by saying, with the most graceful diffidence, "one other service which *I think* (the Italics are ours) I have rendered the art of medicine, in its application to infants and children, is that which relates to the treatment of infantile convulsions."

So all-absorbing does this habit of self-laudation seem to have become with our author, that he candidly admits that he has been led *almost unconsciously* into the enumeration of his own merits: we quite believe it. Would that, for his own sake, he would learn not to think more highly of himself than he ought to think; that he would leave to others the task —and it is an agreeable one—of praising his sayings and doings; and that he would be less impatient of censure, and less uncharitable towards those who differ from him. If he had taught himself, in early life, to feel the full force of that memorable saying, *Magna est veritas et prevalebit*, and had been willing to leave the results of his labours to the public for their award, he might, we are assured, have occupied a higher position in the scientific world; for his mind—unquestionably one of no common stamp—instead of being so often distracted by petty contentions and personal strifes, would have been left to pursue its trains of original enquiry in greater composure and with a more equally-sustained energy of thought. To be a great physician, a man must be of calm and quiet mood; averse alike from the heats of controversy, and from the pursuit of any pet doctrines or favorite notions. Dr. Hall is unfortunately far from being exempt from these defects; and thus it has come that, on the whole, he is considered a better physiological than a practical writer: he is too fond of ingenious theories and too much smitten with the love of innovation to be an unexceptionable guide in the treatment of disease, Though he lived a thousand years, he could never become an Abercrombie or a Chambers.

While perusing the "Observations and Suggestions," we have on several occasions been reminded of Dr. Holland's "Medical Notes;" but this has been rather in the way of contrast than of comparison. The one work exhibits a calm, classical, and reflective mind; the other, a busy, clever, and suggestive fancy. The one is to be read to-day; the other occupies a permanent place on our library shelves. Each is useful in its sphere and vocation; the part of the critical student will be to extract valuable matter from both.

Before proceeding to comment upon the contents of the present volume, it may be as well to say that many of the Articles—or Chapters, as they are inappropriately called—in it have already appeared in print. But, as they are now collected together for the first time, so as to form a substantive work, we have regarded it as a new book, and shall accordingly give it the privilege of an extended notice.

After some very common-place remarks on Homœopathy and Hydropathy, and a few words on the subject of Medical Reform—for the merest

scrap from our author's porte-feuille is deemed worthy of insertion—we come to the *third* Chapter, on *The Physiology of the Nervous System.*

It need scarcely be said that this is chiefly taken up with an exposition of the Reflex functions of the spinal marrow. As there are several other chapters in the volume on the same subject, we have thought it better, in the present article, to omit the consideration of them altogether; in order that we may have an opportunity of blending their contents, not only with each other, but also with those which will doubtless be found in the subsequent volumes of these "Observations and Suggestions." We proceed therefore to something more practical.

On the Use of the Alcoholic Lotion in Phthisis Pulmonalis.

This lotion consists of one part of pure alcohol and three parts of water. A piece of soft linen, folded several times, is laid across the upper part of the chest, just below the clavicles; and this is to be wetted, *every five minutes*, with the mixture—used at first tepid, and afterwards cool. "The application of the lotion should be incessant during the day and all waking hours, the dress being light, or even entirely removed, so as to allow of free and rapid evaporation. (!) It is suspended during the night." This is the principal remedy, by which Dr. Hall assures us that he has benefited, or even restored to apparent health, many persons affected with incipient Phthisis—"marked by dulness of sound on percussion, and no doubtful pectoriloquy under the clavicle, hæmoptysis, and disposition to chills, heats, and early morning perspirations." He subsequently tells us that, according to his experience, this remedy possesses a decided power in checking the progress of the deposition and softening of pulmonary tubercles: *its value* he considers to be *extreme.* We need not mention any of the cases adduced by our author to prove his position. What remedy has not its cures to boast of? Few medical readers, we should think, will be willing to receive "these cases as examples" of the efficacy of the alcoholic lotion: Dr. Hall himself seems hesitating what to say about it:—"I would beg to be understood as stating only the fact, that I have witnessed many, very many, cases of incipient phthisis checked by the strenuous application of the alcoholic lotion, and the patients restored to *apparent* health, these cases having been proved to be phthisis by the presence of the physical signs, as well as the morbid symptoms of this dire disease."

Although little disposed to regard the use of a spirituous lotion to the chest as "the most important remedy in this disease (Phthisis) which we possess," we are much in the habit of recommending it, or something like it—a mixture of equal parts of vinegar, eau de Cologne, and water—as a useful and agreeable means of relieving the dyspnœa that is always present in a greater or less degree. The best way of using it is to cover the wetted pledget with a piece of oilskin, so that the application need not be renewed above three times in the course of the twenty-four hours.

On the Motive for the Scarification of the Gums during Dentition.

We are gravely told, at the commencement of this Chapter, that "the prevailing, I may say the universal, idea on the subject is, that we should lance the gums only when the teeth are ready to pierce through them, and

only at the most prominent parts of the gums." Indeed!—are not medical men in the daily habit of freely and deeply lancing the gums when they are hot, swollen, and painful, and when the child is restless and feverish, although the teeth are far from the surface? and are not the scarifications usually practised not only upon the upper, but also upon the lateral, parts of the inflamed gums?

Every one knows, as a matter of course, that there is a hyperæmic condition of the dental and gingival vessels, during the evolution of the gums; and that, whenever the local irritation, which is necessarily consequent upon this state, exceeds a certain degree, nothing relieves the little sufferer so much as a tolerably free discharge of blood directly from the gums. If unrelieved, the child becomes more feverish, and the risk of convulsionary or hydrocephalic disease supervening is increased. There is nothing *new* in all this. That the seat of the irritation is deeper than the mere gums will be admitted by all; nor were we aware, as Dr. Hall asserts, that it is generally imagined by medical practitioners, that "the focus," from which the nervous disturbance proceeds, "is the nerves of the mere gums seated over the prominent parts of the teeth." It did not require to adduce the evidence of nurses to prove "that, *before* the teeth actually reach the borders of the gums, they may prove the source of much irritation:" the fact is of daily or rather hourly observation.

The practical conclusion which Dr. Hall labours most energetically to inculcate is, that scarification of the gums should be practised not only more deeply, but also much more frequently, than is usually done. He advises that it should be performed every day, or even twice daily, as long as there is fever or restlessness, or any tendency to spasm or convulsion; nay, he would sometimes continue the use of the remedy, even when these symptoms have ceased, with the view of preventing their return. This ultra-vigorous practice of our author is not likely to be followed by professional men, even although they thereby subject themselves to reproof for not adopting *his* suggestions. The repeated application of one or more leeches immediately behind the ears, along with the constant use of cold to the head, and of diuretic purgatives internally, may generally supersede the necessity for often-renewed scarifications.

We must not forget to mention that he thinks that the vascular condition of the gums during Dentition might be ascertained by means of a thermometer, and that a useful means of diagnosis might be discovered by its adoption! What say our readers to this ingenious hint? The concluding paragraph of this Chapter is so truly Marshall Hall-ian, that we should do injustice to him to omit it:—

"I do not pretend, in the above proposition, to have advanced anything new; but in the *locality* chosen for the operation, and in the *promptitude*, *repetition*, *perseverence*, and in the *energy and steadiness of purpose* with which I recommend the measure to be adopted,—if these be fully apprehended,—I believe I do propose something *new*; and when I repeat that since I adopted the plan of *effectually* removing *all* irritation in the gums, stomach, and intestines, in cases of crowing and other convulsions of the same nature, early enough, I have not known or seen a fatal case, I am aware that I propose a plan of treatment at once new and *invaluable*. But half measures are of no efficacy." 34.

On Stridulous Convulsion in Infants.

"The disposition to this disease seems to consist in a peculiar susceptibility of the excito-motor property of the spinal marrow. The immediate attacks are the result of the action of sources of irritation or excitement of this property. This susceptibility should, if possible, be diminished, and the causes of excitement should be most carefully avoided. These are the *two principles* which must, I believe, guide us in our treatment." 35.

So much for the *proximate;* now for the *inducing*, causes of the disease. These are, Dentition, indigestible food in the stomach, acrid matters in the bowels, external agents—the most obvious and important of which are atmospheric vicissitudes—and lastly, mental emotions, as fright, passion, and so forth. Dr. Hall makes some very judicious observations on each of these points. We must, however, take exception to one remark which bears on the interesting subject of the treatment.

"It frequently happens," says our author, "that in the crowing disease, there is a spasm of the gall-ducts, and the alvine evacuation is as pale as white clay. Nothing removes this state of things so effectually as the repeated use of ample 'lavements.' It has accomplished more than the blue pill, the gray powder, or calomel itself." 35.

First of all, is it not very doubtful whether *mere* Spasm of the gall-ducts is of frequent occurrence? It seems more probable, that, in the circumstances alluded to, there is either a positive deficiency of the biliary secretion, or a mechanical obstruction to its free exit from the gall-bladder into the duodenum—in consequence, it may be, of the orifice of the *ductus choledochus* being plugged up with viscid phlegm, or from the pressure of some adjoining viscus. However this may be, we would caution our readers not to attach so much importance to the use of warm water enemata, as Dr. Hall seems to imply in the passage which we have quoted. It is right to mention that he had previously recommended the frequent administration of a grain of calomel or blue pill, *if the secretions be wrong*. Are they not so, when "the alvine evacuation is as pale as white clay?" The addition of a grain of Ipecacuanha and of two or three grains of the Carbonate of Soda to the dose of the mercurial at bed-time, and the exhibition of Castor oil next morning, will be found useful under these circumstances. When the bowels have been sufficiently evacuated, the infusion of Rhubarb or Calumba, to which a little Soda, and a few drops of aromatic spirit of Ammonia and of tincture of Henbane are added, may generally be exhibited, with much advantage, two or three times a day.

The following remarks are well worthy the notice of every medical practitioner:—

"In reference to the *morbid susceptibility* of the little patient, it is, I believe, best subdued by the tincture of hyoscyamus and the infusion of the humulus lupulus. The system may be kept constantly under the gentle influence of these remedies; that of the exciting causes is then less injurious. The gentle tonic influence of sponging the general surface with tepid salt water is also highly beneficial. All inclemencies of the weather being avoided—for heat, cold, damp, and the north-easterly winds, are alike injurious; yet the child should be much in the open air. It should be protected, not only by the *shade*, but by a flannel dress which should cover every part of the surface, whilst the clothing in general should be suited to the season." 42.

With respect to the alleged *thymic* origin of Stridulous Dyspnœa, Dr. Hall is of opinion that the enlargement of the thymus gland—a morbid condition that unquestionably does not unfrequently exist in some places—is the *effect* rather than the *cause*, of the suffocative symptoms.

Without adopting the pathological views of certain German writers on this question, we must confess that we do not think that our author has so satisfactorily proved his position as to entitle him to say that "this case affords another example of morbid anatomy, erroneously interpreted, leading to erroneous views of disease."

On the Use of Setons in Certain Diseases.

"In a variety of cases of acute or chronic, local or limited internal inflammation, I have had recourse to the seton, and uniformly with the most marked success; so that, I think, we may look upon the remedy as almost specific in such cases. It is unnecessary to enumerate them. But hepatitis and nephritis belong to them in an especial manner, and I would suggest this remedy as likely to be of service (if any remedy can) in the case of albuminous urine. In one such case, the urine was more albuminous after cupping. I imagined the effect arose from the mechanical violence inflicted, and recommended the cupping to be performed above and below the precise region of the kidneys. Under the use of this remedy, the albumen diminished, and even ceased for a time." 48.

No one, who has seen much of medical practice, will dispute the great remedial powers of artificial drains in numerous cases of obstinate chronic inflammation, and—not unfrequently also—of incipient organic disease. Thus in Paraplegia, arising from disease of the Spinal Marrow, they will often produce very salutary effects. As a matter of course—and surely this point of practice is perfectly well understood by all enlightened practitioners, notwithstanding Dr. Hall's insinuation to the contrary—in such cases they should always be inserted along the spine, as near to the roots of those spinal nerves that are affected, and, therefore, *above* the transverse boundary of the paralysed parts. He recommends that as many as *four* or even six setons should be inserted in some cases of Paraplegia. Few patients will submit to such an infliction, nor can we understand the necessity of this excessively active—*new*, it certainly is—treatment under such circumstances.

On Cupping.

Is there any thing novel in the following observations?—

"It frequently occurs to the physician to wish to relieve an internal pain or other affection without inducing exhaustion—to relieve the head, for example, without depleting the general system.

"I have found two modes useful in these circumstances: the first is the application of the cupping instrument *twice*, so as to make incisions crossed at right angles, applying the cupping glasses slightly, so as to take very little blood; the second is the application of the cupping glasses alone, commonly called dry-cupping.

"The object of the first mode of proceeding is to induce effectual counter-irritation. The crossed incisions, which may be repeated, become inflamed; or they may be excited to inflammation by proper applications; and in this manner they act as minute temporary issues. Issues and setons themselves are, I believe, more efficacious, at the first, when inflamed, than afterwards, when they merely pour forth a purulent discharge." 51.

If the last remark be true, would not repeated blistering be more useful than either of these means?—and yet such is not the case in many instances of chronic disease.

The suggestions in the following Chapter, *On the Treatment of Lateral Curvature of the Spine*, are all very ingenious; but have they ever been applied in practice? We fancy not.

Next come some clever remarks on the best means of keeping up a regulated temperature and moisture in a sick-room. The following sentence stands out detached and by itself—to mark its importance, we presume:—

"I have frequently thought that boiling water might be made to circulate from the boiler in the kitchen, through a water-stove in the room or rooms above, so as to supply temperature without additional fires." 63.

We pass on to a somewhat kindred subject:—

On the Exclusion of the Atmospheric Air in the Treatment of certain Diseases.

"It is usual in the Parisian hospitals, to trust the treatment of pleuritis greatly to the application of cataplasms. I confess that, when I first heard of this mode of treatment, I thought it trifling. I have since thought that these cataplasms may entirely exclude the influence of the atmospheric air, and prove of real efficacy.

"But whatever may be the rationale, the fact remains as I have stated it; and where the treatment of pleuritis consists greatly in the application of mere cataplasms, a post-mortem examination in this disease is scarcely or not to be obtained, so generally do the patients recover." 68.

Truly this remark savours strongly of the practice of M. Louis; who made the important discovery, some years ago, that bleeding and blistering have little or no effect on the cure of Pneumonia! Dr. Hall appears to be quite smitten with the idea; for he proceeds to remark that "it is, probably, by the exclusion of the atmospheric air that other remedies for inflammatory diseases act; the various plasters, the nitrate of silver, even blisters have this effect. I do not, however, mean to insinuate that they have no other." Nay, more than this, he alludes to a case of Scirrhus of the Mammæ, in which a mild adhesive plaster was applied to the tumor. It remained adherent for years (the same plaster?) and the disease continued stationary. It then separated, and from that period, the disease pursued its devastating progress. Would that we dare hope for such a result from so simple a remedy!

In his observations on

The Use of Enemata of Warm Water,

Dr. Hall strongly recommends them in Icterus, (we have already alluded to his opinion on this point of practice,) in Dysmenorrhœa, and "in cases of intestinal load and irritation, inducing sickness and vomiting, sick headache, sick epilepsy (if I may use this term to designate an attack of sickness, faintishness, perspiration, and an epilepsoid attack), the various fits of children, &c." In such cases, no remedy is so *prompt*, he says, as a large warm water injection. He very judiciously adds that the act of vomiting also is usually very serviceable. In infantile convulsions, the

gums should be freely lanced,—and in Dysmenorrhœa, the uterine region should be assiduously fomented—at the same time.

On the Prevention of Milk-Abscess and Milk-Fever.

Regarding a mammary abscess as consisting originally in a distended condition of the milk ducts, our author very reasonably concludes, that the prevention of the evil will be most effectually promoted by carefully and assiduously *drawing* the breasts, so that there is never any accumulation of the milk in the lactiferous tubes. If, however, the following advice be intended as a universal or even general rule of practice, we must beg leave to take exception to it:—

"As a preventive of milk-abscess and milk-fever, and with other hygienic objects, the infant should be put to the mammæ at the moment it is born. If, in spite of this, the mammæ become in the slightest degree tumid, or febrile action be set up, another and a stronger infant should be applied *without delay*." 75.

To apply a child to the breast, the moment after it is born, is a piece of advice that savours more of "*promptitude, energy, and decision of purpose*" (the Italics are the author's,) than of practical acquaintance with "*Nature's* mode of relief." The milk is rarely formed within from twelve to twenty-four hours after delivery; and we need not say that, as a general direction, nothing should be done to *urge* the secretion. When this is once established, we quite agree with our author—and indeed with every other rational writer on the management of lying-in women—as to the necessity of keeping the mammæ well *drawn*, if there be any disposition to the formation of a milk-abscess. The claim of our author, to having proposed something *new* on this occasion, is really most amusing.

Chap. XV.—*On the Causes and Prevention of Apoplexy and Paralysis*, is one of the most valuable in the book. Dr. Hall describes, with much practical acumen, the various states of the system in which the symptoms, that indicate an impending attack of these diseases, are apt to occur; and he points out, at the same time, how very different should be the treatment that is pursued in different cases. In one case, blood must be drawn promptly and to a large extent; while, in another, all depletion should be carefully avoided, and we should trust to rest and quietude, the application of counter-irritants to various parts of the body, and perhaps also to the internal use of ammonia and other stimulants—so as to restore the equilibrium of the circulation. The tact of the judicious practitioner lies in discriminating the two sets of cases—whose symptoms, be it remembered, are often perplexingly alike—and accommodating his plan of treatment accordingly. The too common practice of at once whipping out a lancet, and opening a vein in the arm of a person who is threatened with a fit, or has already fallen down, cannot be too severely reprobated. Many a patient has lost his life, because a *doctor* bled him. The reason of this is obvious:—there is often more of *syncope*, than of vascular congestion of the cerebrum, in a *seeming* apoplectic seizure.

In ambiguous cases, what is the medical man to do? Our author says:

"There is a resource in such a case, which, in spite of a criticism in a very respectable author, I will again venture to assert, is of immense value, and to

which I shall have to revert in some subsequent chapters. There is no case in which the patient, if bled from a good orifice, in the erect posture, bears to lose so much blood before syncope takes place, as that of real congestion of the cerebral vessels; there is no case in which the full, not to say the lavish, detraction of blood is so urgently necessary. On the other hand, the case of vertigo, and other symptoms of cerebral affection arising from dyspepsia, neither bears the loss of much blood, taken under similar circumstances of posture, &c., nor requires it.

"In a doubtful case, I propose to adopt this mode of blood-letting; first, as a guard at once against the inefficient and the undue loss of blood, and, secondly, as a DIAGNOSIS, and as a prompter of our ulterior proceedings." 80.

We should prefer having recourse, under such circumstances, to cupping, and the use of a stimulating purgative enema. The *effect* of these means will enable the physician to determine whether more copious depletion is advisable.

Dr. Hall's remarks on the *gouty* and *dyspeptic* forms of apoplectic and paralytic disease are exceedingly good, and will well repay perusal. He has omitted to mention that, in the former variety, there is generally a cretaceous state of some of the arteries of the brain or of the heart; or, it may be, of both viscera in the same individual.

Under the name of "*Temper Disease*," our author describes various forms of Neuropathy—a morbid condition, in which, it is well known, there is so often some strange perversion of the will and temper, at the same time. They are usually either of a neuralgic character, with or without a spasmodic action of certain muscles, or of a paralytic one. The patient is always of a more or less Hysterical or Hypochondriacal disposition. Most cases occur in the female sex, and chiefly among young and highly excitable girls. One loses her speech; another the use of her legs; a third cannot swallow; and a fourth vomits all, or some particular article of, her food. Retention of the urine is not an unfrequent symptom; and abdominal pain and tympanitis are almost invariably present, in a greater or less degree. Dr. Hall vouches for the authenticity of the following case; otherwise we should have taken it for one of the cleverly-told stories in the "Diary of a Physician:"—

"A young person of hysteric disposition was bled, and soon afterwards became affected with contraction of the fingers into the palm of the hand. Under the idea that the nerve had been wounded, the cicatrix left by the venæsection was removed: the spasmodic action of the fingers immediately become relaxed, and their use was restored. By degrees the spasm returned, and the operation was repeated with the same good effect, less prompt but not less perfect than before. The spasm returned a third time.

"I now began to suspect that even this strange degree of spasm, during which the nails actually grew into the palm of the hand, was not altogether real. I suggested that the patient should be blindfolded, and that a mock operation should be performed. It was performed: superficial but painful lacerations were made in the integuments: it was pretended that a nerve was laid bare, was divided; and it was loudly said, 'Now the spasm will cease, and she will open her hand;' and she did open her hand! Water was coloured with the tinctura lavandulæ composita, for the want of blood! Again, after a time, the spasm seemed to be returning; but now the whole truth was told; and the patient, for fear of exposure, took care to remain well." 94.

The chapter on *Aphoria*, or *Sterility*, contains some very ingenious, but

(we fear) not very practicable suggestions. After alluding to various phenomena—some of them of much interest*—that prove the close sympathy that exists between the Mammæ and the Uterus, Dr. Hall throws out the following hint:—

"My suggestion then is, that when the mamma is excited at the return of the catamenial period, a robust infant be repeatedly and perseveringly applied, in the hope that the secretion of milk may be excited, and that the uterine blood may be diverted from the uterus and directed into the mammary vessels, and that a change in the uterine system and a proneness to conception may be induced.

"To show that such an event is not improbable, I here quote a singular remark of Dr. Heberden:—'Fœminæ quadragenariæ mammæ cœperunt tumere, et mox lacte impletæ sunt, quod per tres menses exstillabat; protinus vero ut lac in mammis fluere desiisset, mulier hæc e viro suo concepit, quæ per sex annos gravida non fuerat.'"

* * * * *

"I would propose, then, that the patient should sleep, for one week before and during each catamenial period, with an infant on her bosom." 157.

Our author, in his suggestive zeal, makes another proposal, which,—to say the least of it—is rather a droll one. From the well-known effects of a *douche* of cold water on the hypogastrium in exciting contraction of the uterus in cases of flooding, he thinks that "its due administration immediately after intercourse" might be effectual in obviating that "inertia of the uterine system on which atonic sterility sometimes depends. The actions which lead to conception may be of the excited class. Contraction of the uterus may be excited, and be followed by relaxation and ingurgitation. I need only make the observation. The inference is obvious." Who is the medical man that will first make trial of this *new* remedy?

The *Cursory Remarks on Prognosis* in Chapter XXV. are admirable. Their object is to show that, in various maladies there is apt to supervene, *most unexpectedly*, a rapid and often fatal sinking of the powers of life. In diseases of the brain or of the heart, after great losses of blood, or excessive purgation, after parturition in weak delicate habits, &c., this most dis-

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* The following passage from Dr. Rigby's System of Midwifery—published as the sixth volume of Dr. Tweedie's Library of Medicine—cannot be too generally known:—

"The application of the child to the breast is not less valuable for preventing any return of the hæmorrhage, than for stopping it in the first instance. We are *never* perfectly secure against hæmorrhage coming on during the first few hours after delivery, even where everything has turned out as favourably as possible; the exhaustion from the length or severity of the labour, the warmth of the bed, and, in some cases, it would seem, the relaxing effects of deep sleep, are all liable to be followed by inertia uteri and hæmorrhage. In no way can we insure our patient so completely against this kind of danger as by putting the child to the breast. The uterine contraction which it excites is not only powerful, but permanent; nor do we consider that a practitioner is justified in leaving a patient in whom the uterus has shown a disposition to inertia without having insured her safety by this simple, but effectual safeguard." 153.

tressing occurrence has repeatedly been observed to take place. "But the most treacherous cases," says our author, "are those of intestinal obstruction, from various causes. The patient shall have suffered from sickness,—rejecting all food and medicine; and from constipation, resisting every kind of aperient or purgative, however administered, whether swallowed, injected as an enema, or applied to the tongue (croton oil,) or endermically: at length the bowels shall be moved satisfactorily, and the patient shall appear better in every respect! The appearances are fallacious. The powers of the heart (so apt to be impressed through the medium of the stomach and bowels) shall have yielded to the struggle; a state of the most insidious *sinking* has set in. Food is retained; the bowels are freely moved; all pain is gone; the patient, as I have said, appears better in every respect; but, in the course of the night, or in the course of twenty-four hours, sinks and expires."

Dr. Hall points out certain symptoms which often precede this state of exhaustion, and the observation of which, in due time, may lead the practitioner to adopt measures for its prevention. These are *breathlessness* upon the least exertion—*a slight crepitus in the breathing*—*a tympanitic tumefaction of the abdomen*—and *a peculiar severe pain on one side of the neck*.

A very different character we must give of the *Cursory Remarks on Diagnosis*, in Chapter XXXVI.; for, in truth, they are little more than an advertisement that the indefatigable author hopes, "in due time, to lay before the profession a treatise on diagnosis, in all its useful and practical bearings, not unworthy of the present advanced state of medical science and practice." To prevent every possible mistake, this announcement is given twice in the course of the volume.

Dr. Hall's *Treatment of Chronic Bronchitis, Chronic Pneumonia, &c.*, is not likely, we should think, to become popular either with patient or physician. In one case, "*for three whole years* (the Italics are ours,) a sharp liniment was applied over the back and front parts of the thorax, night and morning without intermission. The result was, that the chronic Bronchitis was effectually cured." A reward indeed of diligence, and "of the steady perseverance that may be required in such cases!"

Besides the use of counter-irritants, we should cautiously "exclude the influence of the oxygen, dryness, and temperature of the atmospheric air, on the *external* surface of the thorax." This is most effectually done, we are told, by covering the entire chest with "an ample adhesive plaster;" the patient to wear as a matter of course, a waistcoat of flannel, silk or leather, and to keep the feet warm and dry.

"But the most important part of the treatment is that to be pursued during the night. I have frequently found the following plan of extreme value; a sort of mosquito net is formed of muslin; this is made to pass over and enclose a chair, on which is placed a large jar nearly full of water, at 180° Faht.; and under the same net the patient sleeps. During the whole of the night, he inhales a warm and genial vapour, whilst his face is exposed to it; and the whole surface is influenced by it. A state of the skin, and of the air-tubes and cells, is induced which is very favorable to the cure of chronic inflammation within the chest.

"The success of this plan in chronic bronchitis, pneumonia, and pleuritis, has been most gratifying." 203.

Dr. Hall thinks so highly of this ingenious suggestion, that he has described it in two different chapters. By the bye, he appears to be a great friend of the Arnot stove for warming sick rooms.

The whole of Chapter XXXIV. is taken up with the details of *a case* (sufficiently common in practice) *of feverish or inflammatory Cold, Otitis, Brown-Ague, &c.* If there was "extremely severe Gastritis" present, how comes it to pass that we hear nothing of leeches being applied to the epigastrium? Altogether the narrative is not worthy of the space which it occupies. The little patient seems to have been a pet child. Among other interesting particulars related, we are informed that one evening he "was moved to the sofa, and had his feet put into hot water, whilst his bed was freshened. He took some tea, gradually fell asleep, slept well, and awoke free from fever, and with an appetite."

Chapter XL., *On the Prevention of Insidious Disease of the Brain in Children* is, for more reasons than one, most unsatisfactory—to the professional reader at least: we cannot answer for the tastes of "the general reader, who may be interested in medical matters generally, or in some particular medical subject," to whom the present volume is partly addressed. Reference is made to two cases, in which Dr. Hall, very unnecessarily, intimates that "the medical attendants had been taken by surprise, by the insidious development, progress, and termination of this dire disease (Hydrocephalus) of children; and the question was—how could such an event be averted in regard to the other children?"

Part of the correspondence that took place on these occasions, is given. The first letter is from our author to ———, Esq. M.P., and contains an elaborate account of the *regime* which the doctor advised should be followed out in the case of certain young members of his family. Among other injunctions, he recommends that "a *little mutton* should be taken *thrice* a day,—at breakfast, dinner, and tea; and with this *very little* vegetable food, the latter consisting of stale white bread (five days old, and exposed so as to dry into a sort of biscuit,) well-cooked rice, and a perfectly mealy potatoe." . . . . . . "The shoes should be changed, be this needed or not, for others perfectly warm and dry, four times a day; and oftener if necessary." . . . . . "Avoid calomel, blue pill, &c., (if possible) as *cane pejus et angue* as well as all lowering remedies." After very properly enjoining that the bowels should be freely relieved once every day, the punctiliously exact doctor gives the following see-saw medicinal directions:—

> "I next advise five, seven, or ten drops of steel wine to be given thrice a-day, in a table-spoonful of water, in the midst of meals, for one month; then half, two-thirds, and one grain of the sulphate of quinine, in the form of a pill, thrice a-day at meals, for another month, omitting the steel wine; then *both* these medicines for a third month. I would then give one, one and a half, two, and two and a half wine-glassfuls of the pale ale prepared for India, for a fourth month, omitting the tonic medicines. Then return to the steel wine, the quinine, and both, as before, and so on." 240.

How comes it that no notice is taken of a very important part of the *regime* in such cases—that of not allowing the hair to grow long (more

especially in girls,) and of keeping the head cool by frequently wetting it with water, or any simple spirituous wash?

We know not what to make of the other letters that are contained in this chapter. They are addressed to Mr. ——— ; but whether he be a medical man, or only an *amateur-medecin*, we cannot make out. Certain it is that he writes very learnedly about what he had heard respecting an inflammatory action of the Brain in Hydrocephalus, and about the system of treatment which he had been accustomed to contemplate ; nay, even he gives his opinion touching the necroscopic appearances found in the head of another child whom he had lost. But then the rest of his epistle seems to imply that he is not a regular medical man ; the closing paragraph is strange ; "I owe you an apology, I think, for almost writing for an essay on Hydrocephalus, as well as for the treatment of it ; but I feel sure you will see my position ; and I cannot act in the dark, knowing what little I do."

There are several points in Dr. Hall's reply that deserve brief notice. First of all, he deems it "very questionable whether such a *low* form of inflammation, as that alluded to, really exists in young and not apparently weakly subjects." That a sub-acute inflammatory action of the Encephalon is present in many cases of Hydrocephalus for a length of time before the outbreak of the pathognomonic symptoms, will be admitted, we should think, by all practical men.

With respect to the use of *mercurials*, Dr. Hall appears to be [as we have already seen] decidedly adverse to their employment ; grounding his objections partly on their *lowering* effects upon the system, and partly also because, in his opinion, the intestinal secretions may be corrected without them—nothing being so effectual, he says, for this purpose and for inducing a flow of *bile*, as the warm-water enema.

The concluding paragraph merits an attentive examination. Like most other doctrines in medical practice, the one laid down here is to be received not so much as an absolute truth as in the light of a useful admonition ; a great deal must be left, in every case, to the discretion of the medical attendant :—

"You must constantly bear in mind the difference between the *preventive* and the actually *curative* treatment in these cases ; they are so different as to be almost opposite, both in their character and in their measure. This remark will tend to reconcile what may appear to you to be a glaring discrepancy in the medical opinions which have been given in the cases of your little patients." 253.

In Chapter XLI. are briefly related two or three cases of *Hydrocephalus* —or rather the intense Cerebral Congestion that sometimes constitutes its first stage—proving fatal within twelve and even six hours after the attack. Convulsions are usually the most striking and formidable symptom of this most alarming form of the disease. It is apt to occur during recovery from Scarlatina, especially if the urinary secretion has remained scanty and high-coloured ; but it may take place under other circumstances ; and a physician, therefore, cannot be too much on his guard against its invasion. Prompt and copious blood-letting is the most important remedy ; the use of this potent remedy must be followed by mercurials, active diuretic purges, and the assiduous application of cold to the head.

The remarks in Chapter XLIII., on *Tuberculous Disease of the Abdomen*, are in one respect good; in another faulty, inasmuch as they direct the attention of the reader almost exclusively to the abdominal malady, without attaching due importance to the co-existent affection of the lungs. Tubercles are rarely found—at least, to any considerable extent—within the abdomen, unaccompanied by similar depositions in the pulmonary tissue. In the only one of Dr. Hall's cases, in which a post-mortem examination took place, we read that "the right lung contained tubercles, some of which were softened and suppurated; and the left lung was heavy, fœtid, and replete with tubercles and partial suppuration." The case might therefore be regarded as one of Phthisis, attended with tubercular disease of the abdomen. Dr. Hall dwells with great emphasis on three symptoms, which he regards as characteristic of this disease—*great tendency to coldness and lividity of the extreme parts of the body, a frequent pulse, and slow but progressive emaciation*. The existence of these symptoms should therefore always draw the attention of the physician to the state of the abdomen, and, we need not add, of the lungs, at the same time.

In the Chapter on *the Effects* of *Intestinal Irritation*, Dr. Hall seeks to shew that a morbid condition of the bowels, arising from an accumulation of fæculent matters or from a depraved state of the intestinal secretions, is apt to induce sudden attacks of severe pain, accompanied with the other symptoms of active inflammatory disease, either in the Brain, the Pleura, or in the Abdominal Viscera—but which attacks are in truth rather of a sympathetic and nervous, than of a really phlogistic, character. We need not say how important it must always be to form an accurate Diagnosis in such cases; seeing that the Treatment will, as a matter of course, depend on the opinion that has been formed by the medical attendant as to the nature of the *seemingly*-inflammatory attack. The practical question may be between bleeding to 20 or 30 ounces, and the exhibition of an ammoniacal opiate draught, to allay the pain and other symptoms.

That Dr. Hall has considerably exaggerated the difficulties of an accurate diagnosis, we shall attempt to prove by an examination of his own cases. A middle-aged and rather delicate woman had been very largely bled and freely purged for what appeared to be an attack of Peritonitis; the stools were very fœtid. She seemed to be recovering fast, when, on the fourth day, she was "seized with severe pain of the head, especially over the eyebrows, attended by beating and throbbing, and by the most urgent intolerance of light, so that the eyes could not be opened for a moment for examination; the pain was increased on attempting to sit up erect; the countenance was palish and sallow; the pulse full and frequent; there was no faintness or sighing."

A draught, containing 30 drops of laudanum and as many of Sal Volatile, was administered, and a cold lotion applied to the head. Next day, the patient was much better; and speedily she was quite well. Dr. H. proceeds to say that here was a case, where the symptoms, "usually deemed indicative of Phrenitis *in its most marked form*," were removed, without the lancet, by an ammoniacal anodyne draught! We much doubt whether any experienced practitioner could ever have mistaken the attack of severe *headache* in this case for one of *inflammation of the brain*: the mere cir-

cumstance of the pain being increased in the erect position might have led, we should think, to a more correct diagnosis.

The next case is still more unsatisfactory; for the patient—who was at the time in a restless irritable state from pain and want of sleep for several nights—seems to have been bled for mere *throbbing in his temples, with headache, and flying stitches in his side*, although all the other symptoms clearly denote positive weakness, rather than the existence of any inflammatory action. Judge our surprise therefore when we find, in Dr. Hall's comments on the case, these words: "I think most physicians would have apprehended, at least, some inflammatory affection within the head." Not so, we believe, good doctor; do read the report of the case over again.

The third case seems to have been one of very flagrant mal-practice. The symptoms, as recorded, did not surely warrant the excessive depletions that were employed. The patient, a female, was six times bled; and yet no mention is made on any occasion, either of the state of her pulse or of that of the blood drawn. Suffice it to say that, when Dr. Hall was called in, "there was palpitation of the heart, and sometimes faintness, and a feeling of sinking or dying." By administering cordials and nourishment, and correcting the state of the bowels that were much disordered, this patient quickly recovered.

Case 5 is one of every day occurrence; the attack was nothing but one of bilious or dyspeptic *headache*, and accordingly was relieved very promptly by vomiting and a dose of purging physic. In case 6, we have an example of *pleurodyny*, and in case 7 one of *palpitations* of the heart. As the report of the last is very brief, we shall give it entire, to convince our readers that our ingenious author has somewhat over-strained the point which he seeks to establish in this chapter:—

"In this case, of which the heads only can be given, the patient was afflicted with great *palpitation of the heart*, which returned in paroxysms. The attack would come on from various causes, induce great alarm and sense of dissolution, with throbbing along the abdominal aorta. The patient was bled profusely, without more than temporary relief. He recovered gradually under the employment of purgative medicine, nutritious diet, and soothing treatment, remaining only subject to dyspepsia." 300.

No treatment could possibly have been worse than profuse blood-letting in a case of paroxysmal palpitations of the heart: a dose of laudanum and æther would, as a matter of course, have been much more appropriate.

We do not by these strictures mean to deny the position of Dr. Hall, that intestinal irritation is liable to be accompanied with attacks of severe pain and febrile excitement in one or more of the internal cavities of the body, and that these attacks may occasionally exhibit many of the characters of active inflammatory action so as to be apt to mislead the inexperienced practitioner. All that we maintain is, that, in the cases related by him, there ought, we think, to have been little or no uncertainty experienced as to the correct diagnosis. How unsatisfactorily is the distinction between actual and *seeming* inflammatory affections of the abdomen made out in the following passage!—

"I had long remarked that there might be both acute pain, and tenderness under pressure of the abdomen, without inflammation. This state of things is frequently the result of intestinal irritation. It is distinguished from inflam-

mation by the *general* symptoms of this affection,—the mode of attack,—the effects of remedies. In inflammation, the surface is usually cool, the head unaffected, the patient remarkably quiet. In the case of intestinal irritation, on the contrary, there is generally much heat after rigor, the head is much affected, and the patient is restless and generally distressed, the tongue is loaded, and perhaps swollen, the alvine evacuations are extremely morbid, and great relief is obtained by the free operation of medicine." 304.

Altogether, this chapter is not at all worthy of the author's well-known sagacity.

The following one, *On the State of Sinking from various Causes*, contains many valuable observations, derived partly from the author's own experience, and partly from the writings of John Hunter and Sir H. Halford. In infants and young children, this state is apt to occur in the course of cerebral and abdominal affections, after bleeding or purging has been used very actively, or continued for some time. Whenever the surface of the body or extremities become chilly, the cheeks are pale and somewhat sunken, the pulse is rapid and weak, and the child is restless and irritable at one time, and dozing and oppressed at another, it is high time to suspend the use of all lowering remedies, and to have immediate recourse to light nourishing food, gentle cordials and stimulants—brandy and ammonia are usually the best—and the assiduous application of warmth to the body and feet. The patient, under such circumstances should be visited frequently, so that every change in the symptoms may be watched, and the administration of remedies may be regulated accordingly. As calm sleep is one of the most important restoratives, it may be necessary to give two or three drops of laudanum or of the liquor opii sed. in some aromatic water. The continuance of cold applications to the head, after the active cerebral symptoms have subsided, is apt to induce restlessness and discomfort; and we have often observed that, by merely ceasing this application and covering the head with a night-cap, a refreshing sleep has come on, and the young patient has awoke in every respect better.

Passing over the remarks on *Sinking in Old Age*, which Sir H. Halford has very graphically described in his Essay on the Climacteric Disease, we come to the third section of the chapter, that treats of *Sinking in certain Diseases*. The late President of the College of Physicians wrote an able paper on this subject also, entitled the "Necessity of Caution of the Estimation of Symptoms in the Last Stages of some diseases."

Phrenitis, *Enteritis*, *Hernia*,—even after the bowel has been reduced, but before the vomiting has ceased and the bowels have acted—confluent *Variola*, may be mentioned as diseases, in which a fatal sinking is not unapt to occur, at a time when the patient seems to have surmounted the dangerous part of his illness. After quoting some of Sir Henry's observations, our author remarks :—

"The diseases in which the state of sinking is most marked, are, I think, Typhus Fever and Enteritis, Dysentery, or Cholera; though many other diseases lead to this state, and especially some which consist in repeated attacks, each attack leaving the patient weaker than before, until they issue in sinking of the vital powers.

"Amongst the first symptoms, coldness and lividity of the hands are frequently observed, the livid colour disappearing imperfectly on pressure; the cheeks and nose are at the same time usually cool. There are often much general

and indefinable suffering, distress, and restlessness; sometimes slight dozing; at others, slight delirium; and in some cases convulsion, followed by coma; the breathing is sometimes imperfect; at others, little affected; and I have, in some cases, observed the crepitus in breathing, of which I have spoken in the preceding essay, for some days even before there was any other decided symptom of sinking; the voice is frequently altered, and rather husky; the pulse is small and frequent, and perhaps irregular; the motions are apt to be passed involuntarily, and sometimes there is retention of urine. It is usual for some distressing symptom, as delirium in phrenitis, cough in affections of the chest, and pains in those of the abdomen, to have ceased as the state of sinking has come on." 326.

Laennec has noticed, in the following passages, the tendency that exists to unexpected *Sinking* in certain cases of Pneumonia :—

"Chez d'autres sujets, au contraire, la péripneumonie détermine la mort avant que l'engorgement ait envahi le quart de l'organe pulmonaire. Ce fait est propre, ainsi que beaucoup d'autres, à prouver que, dans les altérations de nos organes, la mort est souvent due à l'affaiblissement du principe de la vie beaucoup plus qu'à l'intensité ou à l'étendue de l'affection locale."—§ 201.

"On ne voit que trop souvent des exemples de péripneumonies qui, après l'emploi de la saignée et des anti-phlogistiques, paraissent au bout de quelques jours à-peu-près guérries, si l'on s'en rapportait aux symptômes extérieurs: la fièvre a cessé, la douleur n'existe plus, la toux devient rare et peu pénible, l'expectoration est médiocre, les forces renaissent, l'appétit reparait et devient quelquefois même très-vif, et cependant l'engorgement pulmonaire n'a nullement diminué: la percussion donne un son mat, le cylindre ne fait rien entendre. Au bout de quelques jours, et même de quelques semaines d'une fausse convalescence, les forces tombent de nouveau, et, suivant l'âge du malade, un nouvel appareil inflammatoire ou une dyspnée accompagnée d'affaissement et de symptômes de congestion cérébrale sont promptement suivis de la mort."—§ 212.

Chapter XLVIII. contains, as far as we can judge, nothing that is not perfectly well known to every medical man. To tell us that Arthritis or Gout is a malady "of a peculiar *reflex* action," is merely darkening knowledge by words; and that "in cases of a true arthritic nature, by which I mean the same affection interiorly as we observe exteriorly, the Colchicum seems to be indicated," is a piece of therapeutic information that will certainly not be very novel to any of our readers. That the case of retrocedent Gout, related at length by the late Dr. Haygarth, in the fourth volume of the Transactions of the College of Physicians, and given at length in the present volume, was "plainly and simply one of *intestinal irritation*," we have very great doubts, in spite of the very absolute tone in which Dr. Hall settles the question. The very circumstance that the experienced narrator of the case does not even mention that the intestinal evacuations were much disordered—while he alludes more than once very particularly to the high-coloured and sedimentary state of the urine—might surely have made Dr. Hall pause before deciding so peremptorily on the diagnosis of a case which he never saw.

Chapter XLIX. gives the report of an interesting case of *Chronic Laryngitis*, in which the operation of Laryngotomy was deemed necessary, in consequence of the alarming attacks of dyspnœa to which the patient was liable: a cure of the local disease was subsequently effected by the inunction of mercury, so as to affect the system. It is not stated whether the patient—a woman ætat. 53—recovered her voice completely.

Chapters L. and LI. are remarkable only for their brevity; the longest not exceeding 23 lines. The former is entitled, *On a Source of Diagnosis in Laryngitis.* It runs thus:—

"In pure laryngitis, the patient cannot snuff up: see page 342.* The volume of air so admitted into the larynx, though its due velocity be not wanting, is insufficient to produce that effect.

"Laryngitis, in which there is thickening of the lining mucous membrane of the glottis or larynx, and consequent diminution of this orifice, is distinguished in this manner from tuberculous ulceration of the glottis or larynx, in which, so far from there being diminution, there is augmentation of the orifice.

"The effort to 'snuff up,' in laryngitis, has the most peculiar effect. Instead of the *expected* noise in the nostril, there is an *unexpected* sound in the larynx.

"But not only is the *fact* of diminution of the laryngeal orifice ascertained in this manner, but the *degree* of that diminution is marked by the greater or less *degree* in which the power of 'snuffing up' exists, and therefore the greater or less *degree* of urgency of the case! In the same manner, the diminution or augmentation of the disease is accurately marked.

"The same observations have a certain relation to the *double* danger of this disease—from—1, *immediate*, and 2, *secondary* asphyxia." 349.

The sum and substance of Chapter LI. *On the Treatment* of the *Atrophy of Paralytic Limbs*, by William Frederick Barlow, Esq., are contained in these few lines: "I would suggest ..... that Galvanism be used at intervals more or less lengthened as circumstances indicate, or tickling, friction, and temperature be employed, if these be found to occasion reflex actions."

There is surely nothing *new* in this advice, although the writer seems to think otherwise; for he says: "no one, as far as I know, has proposed that *involuntary* contractions should be excited in them (the muscles) *with a view to their nutrition.*" Really, if we go on at this rate, there will be nothing *old* under the sun.

With this remark we close our notice of this volume. Our readers will be able to judge for themselves, by the extracts we have given, that it contains much curious and not a little instructive information. We look forward with interest for the succeeding volume or volumes, which are promised, and trust that the talented author will, for the sake of his own reputation, render them more free from the blemishes which we have pointed out.

* Reference is here made to the case narrated in the preceding Chapter:— ..... "She described the impossibility of snuffing up the nostrils—an effect, I suppose, of the partial closure of the larynx; for to produce this snuffing, it is necessary that a certain *quantity* of air should be drawn through the nostrils with a certain *velocity;* and, in the present instance, the *quantity* of air admitted appears to have been too small. The patient experienced increased uneasiness on drawing the head backwards."

I. Lectures on Pulmonary Phthisis. By *John T. Evans*, M.D. Dublin, 1844. 8vo. pp. 196.

II. Researches on Phthisis. By *P. C. A. Louis*, M.D. Second Edition. Translated by *W. H. Walshe*, M.D. London (Sydenham Society) 1844. 8vo. pp. 566.

III. Synoptical Account of the Effects of Certain Medicines applied to the Treatment of Asthma and Consumption, on the Principle of Endosmosis. By *W. H. Brown*, M.D. 1844. 8vo. pp. 24.

Disheartening as is the fact that notwithstanding the immense amount of labour and talent which has been of late years devoted to the investigation of the phenomena of Phthisis, little or no progress has been made in its therapeutical management, it is gratifying to find that the subject is not abandoned in despair, but still occupies the time and thought of intellects of the highest order. They justly deem it an inconceivable anomaly that so vast a proportion of mankind should thus be permitted to perish in the very prime of life; and are willing to believe that diligent research and extended means of investigation, will yet one day be rewarded by the discovery of the manner of limiting the ravages of this devastating plague.—M. Louis believes that future inquiry can only be pursued with probable chance of success, by means of the *association* of a great number of well-qualified inquirers, for the purpose of observing and recording upon an extensive scale all the phenomena of the disease for a considerable space of time, as they may occur in individuals placed under every variety of circumstances. Could a record of this kind be obtained, that it would become a vast aid in improving our knowledge of the etiology and treatment of the disease cannot be doubted; but there are so many obstacles to the forming of one with sufficient accuracy to be depended upon, that we fear it must be placed among the large assemblage of things which are rather desired than hoped for.

In the mean time individual observers are by no means idle, and although the productions they send forth are too often the result of a crude generalization, a misapprehension of fact, or a desire to obtain popularity and its consequences by promising to an ignorant and anxious public that which in the present state of science is impossible; yet enough valuable matter is continually put forth in independent publications, or the British and Foreign periodicals, to show that a different order of minds has also deeply engaged in the contest with this dread enemy, and thus to stimulate cooperation and prevent despondency.

Dr. Evans, to whose work we shall chiefly confine ourselves in this article, believes that in the amended pathology, which he presents in his "Lectures," we may obtain a rational indication of treatment; and he is by no means disposed to regard the disease so necessarily, or so usually, fatal as do the majority of medical men. We have, of course, no intention of presenting an analysis of so well known a work as that of M.

Louis, but it will be desirable to advert to some of the new matter he has introduced into the present edition. The view this author takes of the probabilities of cure is far less sanguine than that of Dr. Evans, and although we fear it is the more correct of the two, we cannot but subscribe to the justice of the criticism delivered by the latter upon this celebrated work. He says—

"I have found it necessary to differ in many things from the modern Parisian school of stethoscopists. In M. Fournet's book, there appears to me to be many old observations put forward with an imposing air of novelty, and many new assertions destitute of foundation. M. Louis' work on Phthisis is of a higher order: admirable on account of its careful pathological descriptions, most useful as a repertory of elaborately-drawn cases; yet, I must consider its etiology illogical, its diagnosis rather meagre, and its treatment inadequate."

PATHOLOGY OF PHTHISIS.

Dr. Evans believes that attention has been unduly directed to the nature, detection, and removal of *tubercle*, as if it were the *cause* of the various symptoms, whereas it is but the result of a peculiar form of inflammatory action, occurring in persons possessing the *phthisical predisposition.* To the examination of this predisposition, as the first stage in the production of phthisis, he attaches great importance; and, after alluding to various circumstances which may give rise to it—as hereditariness, exposure to cold and damp, absence of light, the debility caused by various diseases, &c.—he thus speaks of its nature :—

"From a careful consideration of the causes which tend to predispose to the development of tubercle, I think you are justified in coming to the conclusion that this predisposition consists in a deficiency of that manifestation of vital force whereby the tissues are enabled to grow at the expense of the circulating fluid. This deficiency may be congenital, or it may be the result of external circumstances : it may be confined to an organ, or it may implicate the whole system. But we are led by strict induction to believe that when this predisposition exists, the slightest local inflammation is liable to terminate in that peculiar variety of fibrinous secretion intermediate between lymph and pus, to which has been given the name of tubercle.

"Comparative anatomy and embryology prove that the development of muscular tissue is the product of an action of growth, of a higher order than that which gives rise to cellular and nervous tissues, it consequently follows that in a general arrest of development in the organism, the muscular tissue should suffer first, and in the causes which tend to produce atrophy, this tissue should first present a deficiency of nutrition. Therefore it is, that in the predisposition to tubercle, we find a want of proportion between the red and white tissues, the latter are present in excess, and it has been supposed that an excessive development of the white tissues predisposed to tubercle. But from what we have seen you can evidently understand that it is not an hypertrophy of the white tissues, which constitutes the predisposition : but that the same causes that predispose to tubercle, produce likewise atrophy of the red tissues.

"You may perceive how well the locality which tubercle generally occupies, corresponds with the two-fold method of its production ; we might be led by pure calculation to conclude that the lungs, of all organs in the body, ought to be most liable to inflammatory affections, subject, as they are to every atmospherical change, kept in never-ceasing activity ; and then, on the other hand, the upper lobes are

those in which nutrition is least active, and the left side, again, is in all the higher animals, the least developed." 15.

In the Appendix to his work the author examines, at considerable length, the foundations upon which M. Louis rests his statement, that *inflammatory action is not the fore-runner of phthisis.* Upon the observation by this eminent pathologist, that pneumonia, pleurisy, and bronchial inflammation, do not cause the deposition of tubercle, Dr. Evans observes—

"M. Louis considers, that it is impossible to maintain that inflammation is a powerful or common cause of phthisis. But in his treatment of this subject, he seems to me to have fallen into the sophism which logicians call *ignoratio elenchi;* that is, he has proved a thing which has no necessary connexion with, and, therefore, does not determine the question. The question is, are tubercles a result of *an* inflammation? M. Louis proves, that plastic or suppurative inflammations do not give rise to the deposition of tubercles; and therefore he draws the conclusion, that tubercles do not arise from *an* inflammation. If inflammation was a thing capable of an exact definition, having always the same anatomical appearances, accompanied by the same vital aberrations, and characterized by the same alterations of functions, this conclusion might be justified. But pathologists know that this word is, on the contrary, very vague in its interpretation; is intended to express extremely varied combinations of lesions; and differs very much in its results under various circumstances. Sometimes inflammation produces softening, at others induration; sometimes it causes secretion of pus, at others coagulable lymph; nay, mere congestions from atony or venous obstruction, have been called asthenic or passive inflammations. If M. Louis succeed, therefore, in proving that ordinary pneumonia, pleurisy, or bronchitis, terminate in the majority of instances, without the development of tubercles, we may admit the truth of his deductions, and yet remain as much as ever in the dark, as to whether tubercles are a result of *an* inflammation." 167.

The author next enters into a critical examination of the cases of Acute and Latent Phthisis cited by Louis, as proving that tubercle originates independently of inflammation, but from which he draws totally opposite conclusions.

In the same part of his work, Dr. Evans opposes himself to the generally received opinion of the *identity of the tuberculous cachexia and scrofula.* After quoting Sir James Clark's description of the tuberculous diathesis, and complaining of its vagueness, he adds—

"The fact is that Sir James was partly influenced by experience, and partly by prejudice, in penning the above description. Experience warned him that he had seen Phthisis attacking every variety of constitution: while prejudice suggested to him, that struma being, according to common opinion, identical with tubercular disease, he should mix its acknowledged phenomena as elements of the picture. But is there any sufficient evidence that scrofula is identical with the phthisical diathesis? I think not, and am inclined to regard these states of the constitution as totally independent of each other, for the following reasons: 1st. I see every day numerous examples of phlyctenular ophthalmia, prurigo, ricketts, &c., diseases confessedly peculiar to scrofulous children. I am frequently called upon to prescribe for lymphatic-looking infants, with tumid upper lips, dilated pupils, swollen bellies, and enlarged cervical glands: but upon inquiring as to the diseases to which their parents and other relations have been liable, I do not find that consumption or decline is mentioned more frequently than among any other class of cases. I have known many large families, the members of which, have been all more or less subject to scrofula, in one form or another, and none of them had ever got phthisis. 2nd. Upon inquiring into

the early history of numerous phthisical patients, I have remarkably seldom met with persons who at any time presented the characteristics of struma. Nay, in one remarkable instance, when, out of a family of eighteen members, fourteen died of phthisis, not one ever presented a symtom of scrofula, unless acute hydrocephalus in one child could be considered such." 189.

The cause of *Emaciation* in phthisis is thus stated :—

"We have already seen that the predisposition to phthisis consists in a diminution of the force of growth, of that vital attraction whereby the tissues draw from the circulating fluid the materials of their nutrition. It is not difficult to understand, that a diminished power of growing is equivalent to an excess of waste, in producing atrophy of the tissues. If this view be correct, emaciation is one of the essential elements of the disease. It is not the result of tubercle, but is produced by the causes which predispose to tubercle; and if this be true, we should be led to expect that not unfrequently a general atrophy should precede any local evidence of the deposition of tubercle." 21.

In respect to the influence of *Hæmoptysis* in producing phthisis, Dr. Evans is again at issue with M. Louis. The latter author observes :—

"Hæmoptysis was long considered an exciting cause of phthisis: and M. Fournet, in an extensive work recently published, adopts the obsolete notion. But it is impossible to discover the foundation upon which this writer bases *it*; for no proposition is at the present day more satisfactorily proved, in the *opinion* of all accurate observers, than the extreme rarity of hæmoptysis of any *amount*, unless as a dependence upon tubercles; so that, admitting *argumenti gratia* that attacks of hæmoptysis of this kind, are sometimes the exciting cause of a deposition of tubercles, the fact could not be proved. It is impossible, then, *in* the existing state of things to regard hæmoptysis, either of considerable or *trifling* amount, as a cause of tubercles." 505.

Dr. Evans believes, on the contrary, that the profuse hæmoptyses, which are sometimes observed in young people, may give rise to the phthisical predisposition, and thus operate as the cause of tubercle. He says :—

"The question is one of vast practical importance. It involves the consideration of whether we are to put into operation every known means of arresting hæmorrhage, cheered with the hope of being able to ward off the tubercular deposition; or whether we are to feel depressed with the conviction, that the seeds of decay have been already sown. M. Louis' argument comes to this, that because in the majority of cases of profuse hæmoptysis, the patients have ultimately become phthisical, we are therefore to consider tubercles to have been the cause of the hæmorrhage; although it may have occurred in a person previously healthy, and who had not as yet presented either rational symptoms or physical signs of pulmonary disease."

"M. Louis himself acknowledges, that this is frequently the case. He says [p. 167,] 'Either in its severe or slight form, hæmoptysis sometimes occurred a variable time before the appearance of the cough or expectoration. Such was the case with 12 of my patients (out of 57), 8 of whom had had severe hæmoptysis. This form set in still more frequently than the other, in course of, or at the commencement of, the first period of the disease, in the proportion of 9 : 7. Spitting of blood occurred but rarely towards the close of life, when the patient's feebleness had reached the maximum.' With these observations I perfectly agree; and I cannot but thank M. Louis for the candor and truthfulness of his observations, at the same time that I am often compelled to differ from his conclusions." 193.

The rarity of *hæmorrhage at an advanced stage of phthisis* depends, as

shown by Leannec, upon obliteration of the vessels in the neighbourhood of cavities. Of the circulation in the tuberculated lung, M. Louis observes :—

"Since the publication of the first edition of this work, the morbid anatomy of the tuberculized lung has made unquestionable progress, more particularly in respect of its vascular system. It was, no doubt, well known fifteen years past, that the ramifications of the pulmonary artery penetrate neither into tubercles, properly so called, nor into gray semi-transparent granulations : but our knowledge on this subject has since then advanced. It is, in truth, now established by the inquiries of M. Schroeder Van der Kolk, and more especially those of M. Guillot, that the branches of the pulmonary artery stop short at a certain distance $1\frac{1}{2}$, 2, or $2\frac{1}{2}$ lines from tubercles or gray granulations; and the more these adventitious productions increase in size, the further do the divisions of the artery stop from their perimeter. To such a degree is this true, that when tubercles are of large size, or have given place to cavities, they may be surrounded by a sort of involucrum, ten lines broad, into which no ramification of the artery makes its way. M. Guillot's injections appear to me to render doubt upon this point inadmissible."

M. Guillot's remarks also prove that, after a short period, small vessels are observed to be developed in this involucrum, which, after remaining awhile unconnected with the rest of the vascular system, communicate with the bronchial arteries, or, through the medium of the false membranes so commonly found on the pleural surfaces, with the parietes of the chest. In proportion as the tubercles augment, and soften, the branches of the pulmonary artery become replaced with this adventitious vascular system. Thus accomplishing "the great transformation of the circulation, one of the most remarkable phenomena attending the evolution of phthisis." The new vessels, which become exceedingly numerous, stop short around tubercles without penetrating their substance. They penetrate, however, into the prominences of cavities, and ramify upon the bands so frequently found stretching between their parietes.

"Hence, observes M. Guillot, it is not only the highly vascular web surrounding cavities, with its new circulation, that constitutes a striking feature in the anatomy of those excavations,—but further, the terminal tufts which bring the arterial blood, derived from the aortic circulation, into contact with the atmospheric air. The question next naturally arises, how the aortic blood, thus distributed through the tuberculous lungs, returns to the heart. The fact ascertained by M. G. that the substance of injections thrown into the aorta is found in the pulmonary, bronchial, and azygos veins, supplies a satisfactory answer to the query. He observes that among the effects of this double current, there must arise a change in the nature of the blood of phthisical subjects, and a special modification of the organism generally,—that in proportion as the tuberculous affection makes progress, so do the lungs, in direct opposition to ordinary laws, acquire increased capacity for arterial blood, and lose it for venous." 30.

Lesions of the Bronchial Glands in Phthisis.—M. Louis enters into some particulars respecting these in the present edition:—

"Although I scarcely made any mention of the bronchial glands in my former edition, these bodies very frequently undergo tuberculous transformation—not only in children, in whom all accurate observers coincide in regarding the transformation of these organs as even more frequent than that of the lungs, but also after the age of 15 in those of adult years. Since 1825 I have examined

the bronchial glands with attention in 70 phthisical adults, and found them tuberculous in twenty (?) to various amounts, or in about one half the cases; whereas, in the same number of persons, the mesenteric glands were tuberculized in 23 cases, and the cervical in 21.

"The bronchial glands, when tuberculized in the adult, are of more or less considerable size, though smaller than in infancy, at which period compression of the trachea and bronchi is a far from rare effect of their enlargement. When thus increased in size, the bronchial glands, unlike those of other parts of the body, exhibit no red discoloration in the spots not filled with tuberculous matter; far from this, they are of greyish and blackish colour, and generally speaking of firm consistence, and in some cases contain only a hard matter, like cretaceous, stony, or osseous substance. The glands thus affected are sometimes, as noticed by M. Andral, of small size, and as it were shrunken; and they are commonly found in this state, according to the same observer, in individuals whose lungs also present appearances of an analogous character, or an incipient condition of cicatrization,—circumstances favouring the belief that they themselves are in the progress of cure. The course of the glandular affection is very variable, and occasionally extremely rapid. Rapidity of course is proved by the discovery of the traces of the affection in individuals, cut off by phthisis in less than two months; for, as we shall hereafter see, the notion that the bronchial disease can have originated—at least in the adult—before that of the lungs, is inadmissible."

Of 26 cases occurring in children, mentioned by MM. Rilliet and Barthez, in 18 the tuberculous cyst communicated with the bronchi or parenchyma of the lung—the communication with the bronchi occurring 15 times, that with the substance of the lung three times.

The following is an abstract of M. Louis' "Summary" of the Pathological Anatomy, founded upon his observations both prior and subsequent to his first Edition:—

"Recent inflammation of the *lungs* or *pleura* co-existed with tubercles or cavities in $\frac{1}{10}$ of the cases. Ulcerations of the *trachea* in somewhat less than $\frac{1}{3}$, and a changed condition of its mucous membrane in $\frac{1}{5}$. *Pericardium* contained fluid in $\frac{1}{10}$, and exhibited traces of inflammation in several others. The *heart* frequently soft: the *aorta* red in most young persons, and altered in structure in those above 40. *Stomach* very much distended, and its mucous membrane affected in $\frac{1}{12}$, in being softened and attenuated, or softened and very red in $\frac{1}{2}$: ulcerated or mammillated in many. It was quite healthy in but $\frac{1}{5}$. In $\frac{5}{6}$ of the bodies examined, ulcers of the small *intestine* were found, and nearly as frequently in the large. The mucous membrane of the canal very soft in one-half, and healthy from one end to the other in only three cases. Transformation of *mesenteric glands* occurred in $\frac{1}{4}$ of the cases. The *liver* had undergone fatty transformation in $\frac{1}{3}$, and the *spleen* and *kidneys* tuberculous change in about $\frac{1}{8}$. *Prostate gland* transformed in several cases, and the superficial stratum of the interior of the uterus converted into tuberculous matter in three cases. Effusion into the *abdomen* was found in $\frac{1}{4}$, and a small quantity of pus in the pelvis in four cases. *Arachnoid* very frequently thickened and granular. *Pia-mater* infiltrated, and *ventricles* distended in $\frac{3}{4}$ of the cases. The *brain* injected in $\frac{1}{4}$, and its consistence diminished in $\frac{1}{20}$ of the cases. In the same number partial palsy, softening, and, in a few, tubercles, existed.

"The period of origin of these various anatomical changes varied materially; some of them—pneumonia, pleurisy, softening and reddening of mucous membrane of the fundus of the stomach, pulpy softening of that of the colon, acute peritonitis, arachnitis, partial pulpy softening of the brain—set in at the close of life. The majority of them were inflammatory—a circumstance showing that

feebleness was less an obstacle to, than a condition promoting, the development of inflammation. The others originated at some more or less remote period from the fatal event, sometimes at the very outset of the disease; such were the vast intestinal ulcerations in some cases, the tuberculous granulations of the meninges, and the chronic peritonitis in others.

"These lesions were, in a certain point of view, of two kinds; some of them appeared proper to phthisis, others were quite independent of its influence, and existed in different degrees in chronic diseases of all kinds. Among the former are ulcerations of the larynx, and more especially those of the trachea and epiglottis, ulcerations of the small intestines, and fatty disease of the liver. So true is this, that the detection of an ulceration in one of the organs just named, &c., might, independently of all further investigation, be considered as the certain announcement of the individual presenting it having died phthisical.

"Another lesion proper to phthisical subjects was *tubercle*, or the gray semi-transparent granulation, or the gray matter in masses. Wherever these products presented themselves, *I have never observed them in any viscus, without their being likewise present in the lungs*. I speak, be it remembered, of individuals who have passed their 15th year. Whence the apparent conclusion that their existence in the lungs forms a necessary condition for their development in other parts."

M. Louis, after observing that when tubercle was co-existent in other organs, as well as in the lungs, it was always found (with one exception) more advanced in these latter organs; alludes to the only exceptions to the law before stated he is aware of:—

"However, as my object is not to support any given opinion, as such, rather than another, I am desirous of adding that I have met with an exception to the general law in question. The individual furnishing it died of typhoid fever. There were no tubercles in the lungs, and yet there was a small quantity of tuberculous matter in one of the mesenteric glands. I have met with another exceptional case since the publication of the former edition. A third has been recorded in a contemporary journal. But these infinitely rare exceptions do no more than throw into stronger relief the importance, and almost universitality of the law." 154.

We may conclude this section of the subject with quoting the summary of the opinions held by Dr. Evans, as stated in certain "Pathological Propositions."

"1. Phthisis is a disease characterized by a deficient force of growth, together with symptoms both local and general of active pulmonary congestion. 2. The preponderance of white tissues in this disease is due to a diminished force of growth, whereby the tissues generally, but the red in particular, are rendered incapable of attracting from the blood their normal quantity of aliment, and by which their power of resisting decomposing influences of external agencies is diminished. 3. The diminution of the force of growth depends upon abstraction of natural stimuli and aliment; for example, want of heat, light, oxygen in the blood, &c., and the food being insufficient and innutritious. 4. The active pulmonary congestion depends upon the application of stimuli too violent and too prolonged, and may display itself either in the form of bronchitis, hæmoptysis, or pneumonia. 5. The symptoms of active pulmonary congestion in this case, are hectic fever, hæmoptysis, catarrh, cough, altered voice, together with derangement of the digestive and uterine functions. 6. The pathological appearances of the active pulmonary congestion are those of bronchitis, pulmonary apoplexy, or of pneumonia, in the stage of engorgement. 7. The same causes which produce the symptoms of phthisis, are likewise apt

to produce the secretion of what is called tubercle, an albuminous substance, intermediate between coagulable lymph and pus. 8. The parts of organs that have secreted tubercle, are subsequently disposed to ulcerate and suppurate, and the tubercle, at the same time, to soften in part, into a fluid similar to pus. 9. Abscesses formed by the softening of tubercles, and the ulceration and suppuration of surrounding parts, are subject to the ordinary law of abscess—viz., burrowing to and bursting from the surface presenting the least resistance, following the least organized track in their fistulous course, cicatrizing by the means of a lining membrane, &c. 10. Masses of tubercle and tuberculous cavities are generally surrounded with indurated lungy substance, of a black, yellowish, or grayish colour. 11. In proportion to the amount of this induration will be the signs of impeded circulation, namely, dilatation of the right cavities of the heart, and enlargement of the extremities of the fingers. 12. The existence of tubercles is not signalized by symptoms, nor their absence a cause of amelioration in disease. 13. The presence of tubercles never causes inflammation in the surrounding tissues. 14. The state of emaciation being a direct consequence of diminished force of growth; and this latter being the predisposing cause of phthisis, we ought to expect emaciation, or something analogous to it, to precede in general the local signs of phthisis. 15. The lesions in phthisis most important to be kept in mind, are the deficient force of nutrition, and the local pulmonary irritation; and the symptoms of this disease, namely, the emaciation, hæmoptysis, hectic fever, cough, alteration of voice, loss of appetite, thirst, constipation, diarrhœa, amenorrhœa, &c, are all, more or less, the consequences of these lesions. 16. Hæmoptysis, when very profuse, may be the cause of the diminished growth, and pulmonary irritation of phthisis. 17. Subacute gastritis may predispose to phthisis. 18. Excessive discharges, as diarrhœa, menorrhagia, &c., may produce diminished force of growth, and thus predispose to phthisis. 19. The suppression of menstruation in a person predisposed, may produce active pulmonary congestion, and thus give rise to phthisis." 32.

Semeiology.

M. Louis presents us with two tables of the *duration* of the disease, derived from the observation of 307 cases. The results are as follow. Three died during the 1st month: between the 1st and 3rd month 16: from the 3rd to the 6th month inclusive 79: from the 6½th to the 12th month inclusive 100: from the 12½th to the 24th month inclusive 64. From the beginning of the 3rd year to a period extending in some cases over very many years, 42 cases.

He calculates the mortality produced by phthisis, compared with that caused by other diseases, as nearly 1 : 2; for of 358 subjects expiring during 3½ years, in M. Chomel's wards, 123 died of phthisis, and 235 of other affections: and if to the former number there be added 40 others, who, though cut off by other diseases, had tubercles or cavities in the lungs, we find that nearly one-half of these 358 were phthisical at the time of death.

We may notice some of this author's new observations upon Chronic Peritonitis and Meningitis, in connection with Phthisis.

Chronic Peritonitis.—The symptoms are generally few and sometimes so slight as to pass unnoticed, but when observed are usually sufficient for diagnosis. The affection comes on at a variable period in the progress of

phthisis, sometimes at its very commencement; and is first denoted by tumefaction and slight pain of the belly, fluctuation or tympanitis, more or less considerable, being after a while detected. The fluctuation disappears, but the tympanitis continues. "In cases where it occurs at the outset, without appreciable effusion, the tympanitis diminishes after a certain time, and then the tense resistance of the abdomen becomes more marked, the form of the convolutions of the intestines becomes visible externally, the abdomen appears nodulated, and is extremely elastic, even when the muscles of the parietes are in a state of complete relaxation." Nausea and vomiting are rare, except towards the close, when acute peritonitis supervenes. Where this latter does not occur the patient still suffers much, and the condition of the abdomen is that which most distresses him. In other cases, in which precisely the same anatomical changes have occurred, the patient suffers no pain whatever. In some very chronic cases, the symptoms of peritonitis eventually disappear, the serum being very rapidly absorbed. These symptoms, though few, when associated, are of great diagnostic value; and even have led to the secondary diagnosis of pulmonary tubercles themselves, in cases which gave no index of these from general symptoms, or auscultation.

M. Louis thus sums them up:—

"The existence of chronic peritonitis might be regarded as matter of certainty in any individual who had, within a variable space of time, and in the order in which they are mentioned, experienced the following symptoms:—

"1. Abdominal pain, commonly general and not severe, though very troublesome, without diarrhœa. 2. Increase of size and of sonorousness of the abdomen: which soon after becomes the seat of obvious fluctuation; in cases where there neither exists, nor has existed, any symptom of organic disease of the abdominal viscera, of the liver more especially, of the kidneys, or of the heart. 3. The more or less rapid disappearance of the effusion, after which the abdomen, slightly and generally tympanitic, exhibits on its surface the outlines of the intestines, distended, in consequence of the difficulty with which the matters circulating through them make their way onwards.

"And all this is accompanied with weakness which is not explicable by the state of the lungs, nor by that of the excretions, which are not by any means unnaturally abundant." 246.

Tuberculous Meningitis.—The symptoms of this affection, first studied in children, have often been observed by M. Louis in adults, since his former edition, and he confirms the accuracy of its description as given by M. Lediberder. The disease may arise at various periods of the phthisis, and manifests itself at first by severe, continued headache, the face becoming alternately red and pale, and the intellectual faculties early failing. The cephalalgia is associated with repeated vomiting from the first, and the combination of these two symptoms in a phthisical patient is a very strong indication of tubercles in the meninges. The headache continues intense with exacerbations from 3 to 12 days; the countenance becomes almost idiotic, and the pupils, at first contracted, afterwards dilate. The severe suffering is replaced by a quiet delirium, with intervals of coma; partial paralysis follows, the vomiting ceasing with the headache. The dyspnœa becomes much diminished, as does the fever, or even ceases, even although large cavities exist; but, towards the close of the affection,

both return with increased violence. The duration of the disease is seldom more than 15 or less than 8 days, and intermittence in its progress is of rare occurrence.

The researches of Dr. Gerhard of Philadelphia, and of M. Rufz, show that the same symptoms are observed under the same circumstances in children. Indeed, from these it is seen that the meningitis, so commonly regarded as essential in children, is almost always due to tuberculous disease of the pia mater, and consequently is one of the effects of phthisis.

"The study of this species of meningitis is the more worthy of engaging the attention of the pathologist, from the fact that this affection, like chronic peritonitis, often attacks subjects in whom the tuberculous affection of the lungs has not yet made great advance—in other words, subjects who might have survived a long time had not the meninges become implicated in the disease. Thus the 3 individuals, whose cases have just been narrated, had no more advanced disease than tuberculous and grey granulations in the lungs; and of 13 others, children or adults, whose cases I have analysed with this point in view, 2 only had a small cavity in one of the lungs, and 3 some inconsiderable ulcerations in the small intestine.

"We should, however, deceive ourselves, did we imagine, guided by the evidence of the preceding cases, that the diagnosis of tuberculous meningitis is always so easy a matter, and that it is impossible to confound it with any other affection. The following case shows that, in the adult, as well as in the child, the diagnosis of the disease in question may, in some cases, be extremely difficult." 301.

A case is related which put on all the characters of typhoid fever.

Diagnosis.

Dr. Evans enters minutely into the subject of the *diagnosis* of the different stages of the disease to which he believes attention should be directed. He considers its ordinary division into only two stages (the period prior to and that subsequent to the softening of tubercle), as quite insufficient for any practical purpose. "I have divided the disease into several stages, corresponding to what I believe to be the progress of the lesions; and I have attempted to point out, with the nearest possible approach to accuracy, the signs whereby those stages can be distinguished. The importance of this distinction is becoming every day more apparent to my mind; and I look on it as having been, in many instances, the cause of a fortunate issue to treatment."

He first directs attention to the signs of the *predisposition* resulting from the "diminished force of growth" already alluded to, in which he believes it to consist; and points out that the deposition of *fat* is by no means inconsistent with this theory:—

"We have seen that the deficient force of growth is the cause of the emaciation in phthisis; and that it affects the red tissues more than the white. The waste of the tissues, which may be considered as remaining unchanged in this case, gives rise to the different secretions. Some of these secretions are thrown off from the system, others are retained. Among the latter is fat, which, if the oxidation be deficient, may remain in the system, but if enough oxygen be sup-

plied this will also burn away, forming carbonic acid and water. You are aware that sedentary habits, by diminishing respiration, promote the deposition of fat, whilst exercise, by increasing the respiratory process, causes its disappearance from the system; so that, you perceive, there is nothing contradictory in there being at one and the same time a wasting of the muscles and an increase of fat—the first proceeds from a deficient force of growth; the second from too small a supply of oxygen."

Whether such deposition of fat do take place or not in phthisical predisposition depends upon the absence or presence of febrile action; for where this is present, as is usually the case, the augmented quantity of oxygen carried to the tissues, by reason of the accelerated respiration, hastens their decomposition and prevents the deposition of fat.

"If an individual is observed to become weak and debilitated in the performance of voluntary motions—no matter whether the change takes place slowly or rapidly—and if this deterioration of strength be accompanied by an evident increase of fat, such an individual is in a condition of predisposition to phthisical disease. Again, if an individual be perceived to emaciate sensibly, and if at the same time the pulse be frequent and the respiration hurried, without any evidence of local disease existing whereby these feverish symptoms may be accounted for, this person is equally in a state wherein the slightest irritation occurring in the lungs will suffice to originate pulmonary consumption."

The author next considers the means of diagnosing *pulmonary irritation*, which condition he represents as arising from the application of injurious stimuli, and to be the prelude of, and yet very distinct from, inflammatory action. "When I speak of a stage of irritation, I mean that state in which the tissues are firmer and more dense than natural, more susceptible of stimulation, containing less blood, and deficient in their secretions: while I mean by acute inflammation, a state wherein the part is also more susceptible of stimulation, but swollen with blood, and secreting in an increased proportion."

The evidence of the existence of this pulmonary irritation is the exaggeration of the normal respiratory murmur, termed by Laennec *puerile respiration*. All observers, except Dr. Stokes, have considered this as a sign, not of disease in the part where it occurs, but merely as a vicarious increase of respiration to compensate for an imperviousness of some other part of the lung. It is, however, a substantive sign to be heard prior to the occurrence of pneumonia, and at the marginal extent of its prevalence, when existing. Dr. Evans is at issue with M. Fournet in respect to the augmentation of the *expiratory* murmur, during puerile respiration. In the fever so frequently attendant upon emaciation, the respiratory murmur becomes *universally* exaggerated; but this does not result from the presence of pulmonary irritation, but from the predominance of nervous excitement—denoting however the predisposition to pulmonary consumption. A *localized puerility*, without evidence of other disease in the lungs, to which it may be supplementary, is strong evidence of pulmonary irritation; and, still more so if it be found in the upper lobes, and accompanied by signs of predisposition to phthisis.

As this puerility of respiration is a sign of irritation of the parenchyma, so is *shortening of the duration of the inspiratory murmur* the sign of *bronchial* irritation preceding the deposition of tubercle.

"It is very probable that in the majority of cases, there is both bronchial and parenchymatous irritation; but in such circumstances the sign of bronchial irritation would alone present itself, the mucous membrane first perceiving the contact of the air. If, however, we imagine the efforts made by the lung to produce both these effects to be equal, we would then in fact have no evidence of disease at all; for, in exaggerated respiration, the inspiration is prolonged, in bronchial irritation it is shortened, so that the two phenomena would exactly neutralize each other. If we suppose the exertion to perform puerile respiration, to extend the struggle made by the bronchi against the entrance of air, we would then have respiration performed by several distinct jerks, which might be either few, distinct, and audible, constituting what is called an interrupted or *entrecoupée* respiration; or very numerous and indistinct, the dry crackling ronchus of Fournet."

Irritation existing for a certain, variable period, is followed by *inflammation;* but the inflammation occurring in those predisposed to phthisis differs from ordinary pneumonia in its pathology. "It is not serum or unaltered liquor sanguinis that is secreted, but tubercles, and this not in masses infiltrating whole lobules or lobes, but in numerous isolated points. The signs of this form of inflammation are, therefore, as peculiar as the morbid anatomy." They are thus delivered in brief:—

"Comparative dullness on percussion, feebleness of respiration, the inspiration short from the obstruction to the entrance of the air, the expiration louder and longer from the lung becoming a better conductor of sound, an exceedingly minute crepitus, scarcely audible except upon a forced inspiration, the respiration gradually acquiring a rough, hard, tubular character, at first appearing in the expiration. These are the signs by which you are enabled to recognize the supervention of inflammation in the air-cells and parenchyma, when it occurs during the phthisical diathesis." 66.

A consequence of the persistence of inflammation in a lung, for a certain length of time, in a person phthisically predisposed, is the *production of induration*, which the author believes plays a considerable part in inducing various of the symptoms usually attributed to the tubercles themselves. This induration varies from a dark red or blackish, to a yellowish or greyish colour, and is denoted by *dullness* on percussion and the production of *bronchophony*. A contraction of the lung, which occurs simultaneously, causes a drawing-in of the upper part of the thoracic parietes, and frequently a dislocation of the clavicle from its normal position. This induration, by being an obstacle to the admission of air into the portion of the lung where it prevails, often causes an *emphysema* of other portions, in consequence of the effect of increased respiratory efforts there. By the obstruction to the circulation which it causes, it may induce a dilated condition of the right ventricle, hepatic congestion, and disease, diarrhœa, ascites, anasarca, &c. In the lungs themselves it may give rise to serious complications, as hæmoptysis, and aggravated dyspnœa. Any cause of solidification of the pulmonary tissue may produce these effects; and some "ascribe them to solidification from masses of tubercles; but I cannot conceive how any one can do so, who is much in the habit of examining lungs after death; for nothing can be more rare than to find masses of tubercles sufficient to produce these effects."

We need not pursue the author's observations upon the diagnosis of the *softened tubercle*, the production of *pneumothorax*, and of the various

descriptions of *cavities*, as these do not materially differ from those found in other works. His summary of the appearances of the *sputa* may, however, be extracted:—

"The sputa expectorated at different periods in phthisis, varies according to the lesions existing in the several stages. During the stage of irritation, all secretion is suspended, and the cough is consequently dry. If the stage of inflammation consists in a bronchitis, the sputa will vary, according to the nature of the catarrh. Very rarely it is the crude bronchitic sputa, transparent, coagulable by heat, and very albuminous: more frequently it is the concocted sputa, opaque in defined clots with ragged edges, rendered lighter than water by the bubbles of air mixed with it, but actually specifically heavier, consisting of very little albumen, principally of the spherical granulated globules of mucus, suspended in a viscid fluid, often alkaline in its reaction. This kind of sputa is sometimes, again, mixed with pus, derived from a true suppurative secretion of the mucous passages, more albuminous than the mere mucus, and yielding an oil to æther when agitated with it. This variety of sputa is a sign of sub-acute, or even asthenic inflammation of the lining membrane. A still more common variety of sputa in phthisis, especially in extreme cachexia, is the pituitary. This is expectorated in enormous quantities, has the appearance of the serum of whey, is white and frothy on its surface; the microscope detects in it numerous flakes of epithelium, but few or no mucous globules, and it is scarcely, if at all, albuminous: it has a very salt taste. When this kind of sputa is present, emphysema will be often found to come on. After the establishment of bronchial fistula, with a tuberculous cavity, the sputa generally alters in its character. It now becomes highly albuminous; when examined by the microscope it is found to abound in pus globules and other globules much resembling those of pus, but varying exceedingly in size. These are softened tubercles. White cheesy flakes are also to be observed in it, which sometimes so much abound as to give it a pulpy consistence; at others, these are very scanty. In all the foregoing varieties of sputa, blood globules may occasionally be seen; but the true rusty sputa of pneumonia, is scarcely ever to be recognized in phthisis." 67.

Dr. Evans, in concluding the subject of diagnosis, passes in review the various fallacies to be avoided in the different stages; such as mistaking the enfeebled and bloated condition of the system attendant upon great inactivity of the large intestine for the debility of phthisical predisposition—the shortening of the inspiratory murmur produced by hysteria, intercostal rheumatism, &c., for that of pulmonary irritation—the signs of cured pneumonia or pleurisy for those of induration, &c.;—and concludes with the following estimate:—

"1. That the symptoms of phthisical predisposition are of a greater value in proportion as they are evidently essential. 2. The signs of pulmonary irritation and bronchial inflammation acquire their chief importance from occurring in persons phthisically predisposed. 3. The signs of tubercular parenchymatous inflammation are peculiar, and have a positive diagnostic value, but this is increased by the co-existence of a phthisical predisposition. 4. The signs of induration, as regards the diagnosis of tubercles, are only of value in combination with the rational symptoms of phthisis. 5. The signs of cavities acquire all their importance from the history and progress of the case, in connexion with rational symptoms.

"I may be permitted to add a few observations:—1. As regards *hæmoptysis*, you will often meet with persons who have never spat blood from the commencement to the termination of phthisical disease. On the contrary, hæmoptysis, although profuse, if evidently vicarious, is not necessarily a bad symptom; and

it is no uncommon thing for it to prevail, especially during the first months of pregnancy, in certain individuals, in the same way as others will suffer from pyrosis, or profuse salivation. With respect to *purulent expectoration*, it is a symptom of no value taken alone. Dr. Green of this city, has lately shewn, that, during the absorption of empyema, a very copious purulent expectoration sometimes occurs, without any bad effect. 3. The sign of *diminished vibration of the voice*, as felt by the hand, is really of no value in phthisis; for this vibration is naturally greater under the right clavicle than under the left, and even a considerable degree of induration on the right side, sufficient to produce the most marked dullness on percussion, will be rarely capable of diminishing the vibration enough to cause it to be equal on both sides."

PROGNOSIS.

The question of the *curability* of phthisis is one of as difficult decision as of vast importance. Judging from the vaunts so frequently made in the present day of the specific powers possessed by so many medicinal agents, we might seem to have arrived at that stage of the inquiry which does not admit of farther doubt being entertained. But alas! when we come to examine into the history of reputed cures, how often are we met with evidence of want of good faith, and still oftener of accurate knowledge, upon the part of the observer. The well-known uncertainty of the duration of a given case of phthisis, and the numerous instances in which the symptoms have been arrested, or have stopped short, for an extraordinary length of time, open a wide field both for charlatanism, and for self-deception; while numbers of cases which have been set down as cured, were never examples of phthisis at all, and remain mere monuments of the ignorance in diagnosis of those who have had the management of them. Believing this, however, we think it is no less the duty of all who have the opportunity of pursuing the investigation [and who has not?] to enter diligently upon the trial of various modes of cure, even when as empirically suggested as many of those to which we have alluded are; for not only is the possibility of the eventual discovery of the right one not unreasonable, but many incidental advantages may spring from the researches made in quest of it. To the alchemists in their vain search we are indebted for the discovery of many valuable processes and preparations. But, if we mean to maintain the character of sober, honest, and rational inquirers, we shall employ a little more caution, both in assuring ourselves of the presence of the disease to be cured, and in the frequency with which, and duration of time during which, we test our means of relief, before we offer the results to the profession, much less to the *public*, than has of late been the fashion.

M. Louis refers to three cases in which the disease, not having made much advance, became permanently arrested: and he considers that the researches of Laennec and others have proved beyond doubt the possibility of the cure of phthisis. Those of Dr. Rogee, quoted upon this point, may be alluded to. From them it would seem that the cretaceous or calcareous concretions, formed at the apex of the lungs, are always the sequel of cured or transformed tubercle. Now as 51 out of 100 women, opened by him at the Salpêtrière, without selection, presented one or more of these

concretions, phthisis appears to be more frequent in its occurrence, and far more frequently disposed to stop short in its career, than was imagined. It is however difficult to suppose these cases could ever have been of a very serious kind, or that large cavities are ever transformed into these little masses. Even the period of life when such anotomical changes commenced is very doubtful, observed as they were in aged subjects.

"It appears from all that precedes, how difficult a matter it is to form a prognosis in phthisis, and into what an abundance of errors we should be drawn, were we to attempt to establish it on the invasion of the affection. On the one hand, a certain amount of severity in the symptoms of the outset does not always prevent the disease from stopping short in its course. On the other hand, we have seen that the affection, after having advanced for a certain number of years with much, nay, extreme slowness—perhaps even after having stopped completely for a season—may suddenly assume all the characters of severity, and cut off its victim in a very short space of time. Perforation of the lung may take place very soon after the invasion of the malady; tubercles may form in the meninges; or chronic inflammation seize on the peritoneum. It is impossible, in the present state of knowledge, to foresee the time at which these symptoms will manifest themselves in individuals destined to experience them, or to prognosticate who will be afflicted with, and who exempt from, their development. There are reasons in abundance to prove the wisdom of caution in prognosis:—while at the same time their general tendency is to display the danger of the affection, and the small hope of prolonging existence, when the symptoms assume a severe character at, or soon after, the period of invasion." 476.

Dr. Evans takes a far more, and, unfortunately, a far too, favorable view of the prognosis of phthisis:—

"If you insist on the discovery of means whereby tubercles may become absorbed, or induration be resolved, or abscesses be made to disappear, and be replaced by normal structure, I confess that I am ignorant of any remedial method, whereby such wonders can be effected. But if you look on a pleurisy as being cured, although the side be contracted and the lung compressed; if an ulcer is considered healed, although an unsightly cicatrix occupy its site; then I promise you, that by pursuing a proper line of treatment, you will be enabled to cure many cases of phthisis in every stage. In many instances of incipient phthisis you may succeed in removing every trace of the disease, and leave your patients in as good health as before they were attacked; and in other more advanced cases, you may at least alter the disease from being a rapid and fatal one, into a malady, troublesome no doubt, and requiring constant care, but not more distressing than the generality of chronic affections. These are strong statements, gentlemen; but I hope to be able to support them by equally powerful evidence."

To this evidence we shall anxiously look for confirmation of so remarkable a statement; but may first advert to M. Louis' observations upon the

ETIOLOGY,

And which he confesses are rather "materials for combating error than establishing truth."

1. *Predisposing Causes.*—(1.) *Age.* The examples of tubercle in the fœtus and early months of extra-uterine life are rare, and M. Guyot opened the

bodies of 400 new-born infants without meeting with one. According to the extensive researches of Papavoine, tubercles more usually appear during the first dentition, especially when it is anormal; but still they are far less frequent during the first two years than afterwards, between the ages of four and seven, being the period of greatest prevalence in childhood. The age at which the disease is most prevalent in adults is well known. (2.) *Sex.*—Females are more liable than men. Of 123 cases analysed, 70 were furnished by females, and 57 by males. (?) Out of an equal number of each sex, admitted into the wards for chronic diseases, 40 were cut off with phthisis in the proportion of 25 women to 15 men. Here we cannot but observe upon the *very frequent* typographical errors which so disfigure M. Louis' work in respect to many of the details and totals of his calculations. A strange oversight in one who lays so much stress upon accurate figures as he does, and which might have been obviated in the translation by communicating with him upon the subject. M. Benoiston de Chateauneûf found, by the Paris hospital registers for 1821-36, that $\frac{1}{35}$ of the males, and $\frac{1}{25}$ of the females died of phthisis. Mr. Farr has drawn attention to this preponderance of females in England also. (3.) *Constitution.*—M. Louis strongly doubts that delicacy and weakness of constitution predispose to this affection. He does not state this as a fact, but reasons from analogy, having observed the course of phthisis to be run as rapidly, or more so, in strong than in weak subjects. No reasoning from such a defective analogy as this can however be admitted. (4.) *Temperament.*—Much is not known of the influence of this; but as the lymphatic is most prevalent in women, and, according to Papavoine, in girls, and as females are more liable to phthisis, this temperament may act as a predisposing cause. [5.] *Hereditariness.*—M. Louis has observed nothing decisive in favour of this; and considers M. Briquet has received evidence of its general prevalence upon far too slight grounds. (6.) *Bad Diet, and Violation of Hygienic Laws.*—Although agreeing with Sir J. Clark, that these influences must tend to generate chronic disease, and phthisis among the rest, M. Louis is by no means disposed to allow, with that talented physician, that they have an especial tendency in generating the latter—at least before he can do so, he must have better evidence than the recital of a few cases, which may be mere coincidences, presents. If these causes have so much power in generating the affection, they ought to possess that of hastening its outbreak; but in 30 patients carefully examined, 12 of whom had been badly nourished, and 18 had been submitted from infancy to no privation whatever, yet the average age of the development of the disease was precisely the same. (7.) *The Influence of Occupation* is one of the most difficult pathological problems, owing to its complications, and the numerous elements necessary to be taken into account in any analysis. The question is quite *sub judice* at present. (8.) *Clothing.*—M. Louis doubts the malignant influence supposed by most to be exerted by *stays*. Most of his patients were peasants, who had never worn these until after their arrival in Paris, when their growth was complete; and it is to be remembered that phthisis also predominates in the female before as well as after 15, and consequently before she has commenced using this article of dress. (9.) *Climate and Temperature.*—It was formerly generally believed that

warm countries, especially those of the South of Europe, were exempt from phthisis; but this is now known not to be the case, and Dr. Journee has shown that tubercles are found as frequently in the inhabitants of the chief towns of Italy as in Paris. M. Louis also observes that the opinion of the influence of abrupt variations of temperature being very conducive to the production of phthisis, and great uniformity a powerful means of warding it off, has no evidence in its favor, and refers to Major Tulloch's Report on the Health of the British Army as militating against it.

2. *Exciting Causes.*—(1.) *The influence of Pneumonia, Pleurisy, and Bronchitis.*—M. Louis' opinions upon this have been already stated at the beginning of this article, as also upon the question of *Hæmoptysis* being an exciting cause. (2.) Non-*inflammatory excitement of the Lungs.*—The little influence of this is seen in the fact, that of 42 subjects of cardiac disease, only two presented tubercles. (3.) *Marked and prolonged febrile action* as in *typhoid* fever, may excite the development of tubercle. (4.) *Cold* has long been considered as a powerful exciting cause of the production of tubercle; but, if so, the disease should be especially developed in the Winter months. But of 170 phthisical patients in La Charité, 74 experienced their first symptoms in the warmest, and 76 in the coldest ones; and of 127 patients in Beaujon, 66 contracted the disease in the warmest and 61 in the coldest months. Women, too, who are more subject to the disease, are better clad than are men in Paris. It is said that cold exerts this effect upon the Quadrumana of the Managerie in Paris; but then the cows, which are kept in hot, close, stables in that city, are very liable to phthisis also.

TREATMENT.

M. Louis passes in brief review "the principal means which have of late years been brought forward, as best calculated to arrest the progress of phthisis."

Protioduret of Iron was introduced with great laudation by M. Dupasquier, but neither this nor any other preparation of iron has proved useful in the hands of M. Louis. He delivers a caution well worthy of notice at the present time:—

> "It is true that, in order to obtain accurate conclusions, I took care not to put my phthisical patients on any of these ferruginous preparations till six or eight days after their admission; because daily experience shows that a few days' regulated diet, combined with the use of diluent drinks, will suffice, perfectly unassisted by active treatment of any kind, to produce an improvement in the state of their various functions, to cause decrease of thirst, improvement of appetite, a better appearance of the sputa, greater facility in expectorating, &c. It is perfectly clear that, unless the precaution to which I now refer be taken, a certain improvement, in reality depending upon regimen alone, may be ascribed to the influence of some pharmaceutical preparation, and the observer be thus deceived into most serious errors. It is more than probable, that omission of this precaution accounts, in great measure, for the utterly different views of practitioners concerning the action of medicines."

Chloride of Sodium was recommended by M. Latour in doses gradually

increased from ʒ½ to ℥½, and continued for two or three months, but, after a patient trial M. Louis found the remedy to be worthless. Of the *Subcarbonate of Potass*, of large doses of *Sal Ammoniac* and of *Cloride of Lime* he has had no experience. The inhalation of *Clorine* has been attended with no success in his hands. The few cases he has tried *Digitalis* in have furnished no satisfactory results, nor has he been more successful with *Prussic Acid.* Of *Iodine* and *Creosote* he knows nothing, and the fame of *Naphtha* had not extended to Paris at the period of his publishing this edition. The scepticism with which most observers regard the loudly vaunted pretensions of new medicines for the cure of phthisis, has a tolerably good justification in the history of the above-mentioned ones. Each upon its introduction has been accompanied with vouchers of having cured consumption, no matter how advanced, and yet have they all, one after the other, sunk into merited oblivion.

M. Louis' chapters upon the prophylactic and palliative treatment of this distressing malady, although containing many useful remarks, are by no means equal to the other portions of his work; and we may now turn to Dr. Evans' "Lectures," in which decisive efforts are recommended, not for the mere retardation of the disease, but for its curative treatment. He strongly protests against the too prevalent custom of treating the symptoms of diseases as they arise, without endeavouring to refer them to the lesions upon which they are dependent; and adds that any benefit which can be expected to accrue from the treatment he recommends, will be only proportionate to the accuracy with which the different stages of the disease are recognized. The lesions he distinguishes as characteristic of phthisis occur in the following sequence; a diminished force of growth and reparation, with its consequent excess of nervous excitability: local pulmonary irritation: local pulmonary inflammation with the secretion of tubercular matter: a state of pulmonary induration: a condition of ulceration and suppuration of the lungy substance. *Tubercles* are *only* the *result* of phthisis, "they are incapable of producing any of its symptoms, and their presence has very little influence on the progress of the disease." *Their* treatment must never be the object we have in view. "We have no positive means of judging when they are present. When present we know of no treatment for them: and the best method of preventing their deposition, is by checking the local pulmonary inflammation, which is their immediate cause." We will now furnish an abstract of the mode of treatment recommended by Dr. Evans in these various stages.

1. *Stage of Predisposition.*—The diathesis may be congenital, or produced by cold, moisture, want of light, and bad food, when change in all these particulars may be followed by amendment. A sea voyage to a mild climate, changing so many of these conditions, has often proved of great efficacy. Then the heart's action and the digestive power may be augmented by the judicious use of tonics and alkalis. When there is embonpoint with a pulse of ordinary frequency, wine and fermented liquors may be given to an extent not to cause fever. But when fever and emaciation are present, they are improper. Such fever, arising from the greater predominance of nervous power, is amenable to proper doses of opium and prussic acid. In some cases the predisposition seems to originate from the

presence of sub-acute *gastritis*, which is often very latent, interfering with the due digestion of the food. Here the primary object is the subdual of the gastritis by the avoidance of stimuli and irritating food, the application of leeches, and afterwards blisters or croton-oil ointment, the exhibition of alkalis very much diluted, and small doses of morphia and prussic acid. The phthisical diathesis, in this case, must be combated by the diminution of waste, as by causing the patient to breathe an atmosphere containing little oxygen, either by sending him to a warm climate, or diluting the air he respires with nitrogen or carburetted hydrogen. Mild emollient drinks, as sugar or gum and water, also diminish waste by saving the tissues from the necessity of combination with oxygen. In other cases the predisposition originates in hæmorrhage, especially *hæmoptysis*, which it is therefore very important to check. Repose of body and mind, the avoidance of all stimuli, whether internal or external, as warmth, or the inducing of plethora by too much drink or suppression of secretions, are our principal means of meeting it. The means of diminishing waste are still more limited than in the case in gastritis, as inhalation of gases of any kind would prove very hurtful. The use of gum-water, &c., and the diminution of sympathetic irritation by prussic acid, are all we can advise. It is thus very important to be enabled to relieve hæmoptysis *before* the phthisical predisposition can be established; and this is best accomplished by combating the plethora with venæsection or cupping, and abating the activity of the circulation by full doses of digitalis, tobacco, or hydrosulphuret of ammonia. Nauseating medicines, short of causing vomiting, are very useful. The nervous sympathy is best allayed by prussic acid. The local pulmonary irritation, which first caused the hæmorrhage, and may reproduce it, claims particular attention. The application of bladders of ice to the chest, and the administration of large doses of colchicum or turpentine, as contra-stimulants, best effect its removal. The remaining irritation is removed by the exhibition of saline purgatives, and the application of active counter-irritation to the chest. If, after these energetic means, relapses still occur, acetate of lead and large doses of mineral acids should be given; continuing the counter-irritation to the chest, and dry-cupping between the shoulders. The strictest regimen is indispensable. Any other *flux*, allowed to continue, may engender the predisposition. *Excessive secretion* from an organ may induce the diathesis, as in pituitous catarrh and diabetes mellitus. *Diseases of the blood*, in which there is a diminution of some of its elements, as albuminuria, chlorosis, purpura, and scorbutus, are in themselves instances of the phthisical diathesis. *Contagious febrile affections*, as typhus, measles, variola, &c. often give rise to this diathesis, as does the poison of *syphilis*.

2. *Pulmonary irritation.*—When this becomes established several circumstances act injuriously—such as mechanical exertions of the lungs in singing, talking, &c.—tonics, too nourishing regimen—fever—suppression of fluxes—some of which may be useful in the predisposition, prior to the establishment of the local irritation. Irritation may be induced by direct impression of too powerful a stimulus on the tissue of the lungs, or sympathetically by a distant inflammation, especially chronic laryngitis, metritis, and nephritis. The treatment, in these latter cases, consists in first

relieving the distant inflammation, and then the secondary pulmonary irritation. For this last, Dr. Evans recommends the inhalation of watery vapour, the air of the apartment being surcharged with moisture, by means of vessels of water constantly heated by lamps. Counter-irritation must be applied to the chest by the application, with a sponge, two or three times a day, of a liniment composed of *equal parts of turpentine and distilled vinegar*, made into an emulsion with yolk of egg. Small doses of opium or prussic acid are also highly useful. Repose of the respiratory organs, absence of stimuli, and a farinaceous diet are essential. The counter-irritation must be continued after necessity for it has apparently ceased to exist; and on the subsidence of the irritation, the various modes of combating the predisposition must be resumed.

3. *Stage of Inflammation.*—The treatment of this is the rock upon which so many split. For, if it be attempted to be cured like inflammation existing independently of a diathesis, the cachexia becomes much aggravated; while if it be neglected, the progress of the disease cannot be stayed. The circumstances which relieve the inflammation aggravate the cachexia, and *vice versa*, so that it requires great tact to determine when either class of measures must succeed the other. The inflammation must be first conquered, and for this purpose general bleeding is not admissible, nor even local, carried to a considerable extent. Leeching day after day is a very bad practice. Colchicum and turpentine given in as large doses as can be borne, with long intervals between each, form good contra-stimulants. But the means above all that will be found useful is the *persevering and active employment of Counter-Irritation:* and upon the employment of which the author justly considers himself an authority, having acted for some years as the assistant of the notorious quack JOHN LONG! of whom he says, " After all, I have no hesitation in saying that St. John Long was less of a charlatan than many physicians of the present day, with an alphabet attached to their names; and if his patients placed unbounded confidence in his skill, the reason was, because he actually performed many extraordinary cures." This exaggeration is not to be wondered at on the part of one who stands a confessed accomplice in Long's iniquities, and has only the following lame defence to offer:—

" I confess that at the present moment, after twelve years of regular medical study, I do not think the time that I was so strangely engaged assisting St. John Long by any means mis-spent. The almost intuitive knowledge that we gained of the appearance of patients labouring under the disease, and of their symptoms, from the constant communication with such multitudes as were then constantly presenting themselves before us, has been, I have since found, of infinite service to me. Although at the time I was ignorant of everything connected with anatomy and pathology, as any gentleman need wish to be, I soon discovered that St. John Long's treatment was not infallible, and I have reason to believe that he lost great numbers by his total ignorance of diagnosis as regards the particular stages, and of the proper treatment of particular symptoms. Yet, I could not disguise from myself the fact, that numberless cases that presented all the symptoms of confirmed decline perfectly recovered under his care.

" Looking back on the hours which I once spent with St. John Long, and comparing what my feelings then were with what they are at present, I can scarcely believe in my own identity. It is a curious subject for contemplation;

the very different aspects which circumstances assume, according to the point of view under which we consider them. I once thought that course an agreeable pastime, which now appears a reckless trifling with human health and life. I once reckoned it as amusing a thing to rob the doctors of their patients as the lawyers of their clients. I need not say that my sentiments are now considerably altered. I did not think there was any thing intrinsically wrong in St. John Long's occupation. When we failed in curing a case, I was sorry; when we succeeded I was glad, but that was all I thought about it; and I am sure those who know me will bear me witness, that, had I conceived there was any thing morally erroneously in his pursuit, I would never have patronized him in it. I believe these to be the sentiments of the majority of persons out of the profession; and this consideration makes me cautious in attributing improper motives to others, although they may be engaged in pursuits that my judgment may condemn."

The smallest share of the commonest sense ought to have taught any one moving in the sphere of a gentleman, "having nothing to do but to amuse myself," that there was something more than "morally erroneous" in joining a fellow, whom he had formerly only known as a painter, in his new avocation of "endeavouring to establish his reputation as an empirical curer of consumption!"

We are willing, however, to allow that this derogatory apprenticeship has furnished the author with useful experience as to the capabilities of counter-irritation, which he states was the sole instrument in the hands of Long. He believes that, by the free use of the liniment, before mentioned, applied all over the chest, after moderate local depletion, an entire cure of tubercular inflammation may be generally wrought. Small doses of opium, or prussic acid, may be given at the same time, and the patient made to breathe a moist atmosphere. After the inflammation is subdued the cachexia is to be met with the means already mentioned, such as a sea voyage to the Mediterranean, careful regimen, and the persistence in a gentle counter-irritation.

4. *Stage of Induration.*—This state is not amenable to direct treatment, but some of its consequences, especially congestion of the lungs and liver, may be usefully treated by *dry-cupping*, and, when hæmoptysis or diarrhœa result, by the use of *astringents;* while the danger of acute inflammation occurring in this condition of parts, may be frequently obviated, by establishing a drain by means of a *seton* applied over the seat of the induration.

5. The stage of *Ulceration and Suppuration* "is signalized by the tendency to new tuberculization, and by the exhaustion following profuse secretion from the walls of the pulmonary cavities." Dry-cupping, seton, narcotics, and astringents are here indicated, while distressing cough is relieved by inhaling watery vapour impregnated with sedatives or narcotics. Four cases in which, after all the signs of cavities presenting themselves, the patients regained health, are related: but very few particulars are given.

It may be thought we have dwelt too long upon Dr. Evans' work; but, although we cannot agree with him as to the great extent of the curability of Phthisis, we believe his book likely to prove of great utility in directing attention more distinctly to the different stages of the disease, and the due

modifications of treatment in these. Impressed with the hopelessness of the issue of a case of phthisis, practitioners too often abandon all attempts at modifying and retarding its progress. This should not be; for, independently of the not infrequent possibility of a too unfavourable diagnosis having been made, much may often be done to delay a termination which yet must come. Still, we believe the treatment of the affection is invested by Dr. Evans with a deceitful simplicity, and feel certain that he has often confounded simple inflammatory, and non-inflammatory, affections with the true tubercular disease. According to his statement, the management of this terrible malady may be placed in the same category with that of the various other chronic affections. Would that it were so!

Of M. Louis' work we need say nothing farther, generally esteemed as it is for the pathological accuracy and philosophical spirit that characterize it. The sections upon the prevention and treatment of consumption, however, are certainly defective.

Some dissatisfaction has been expressed at the selection of this work for publication by the Sydenham Society; yet it would seem that a body bearing such a title could hardly do better than extend the knowledge of the productions of one of the great Masters of Medical Observation. That a translation of this new edition ought to be furnished from some source is obvious, seeing that it contains the additional experience, all of a confirmatory character, of its talented author during the last twenty years. That its execution could have fallen into better hands than those of Dr. Walshe we do not believe; and we have only to regret the mistaken delicacy which has restrained him from adding notes to it. We hope the operations of this flourishing Society will not deter our medical publishers from entering into honourable rivalry with them. We feel convinced a wide field, in the republication of the works of the best English authors, and translations of those of foreigners, at a rate which must secure a large body of purchasers, is open before them.

In the "Synoptical Account" placed at the head of this article, Dr. Brown gives an account of the success which has attended the application, in cases of Phthisis and Asthma, to the chest of different fluids, and which he supposes is effected upon the principle of Endosmose. He alludes to the testimony afforded by Dr. Hall, in a number of the Lancet of last year, to the great efficacy which spirituous applications, maintained in constant contact with this part, exert in checking the progress of incipient phthisis. The fluids employed by Dr. Brown are of various composition, as diluted Alcohol, diluted Sulphuric Æther, Combinations of Anodynes, Iodine, Astringents, Acidulous and Alkaline Preparations, &c. He applies them just below the clavicle, by means of a piece of hollowed cork, filled with sponge, or of an apparatus manufactured for the purpose by Taylors, 37 Strand. The applications are renewed three or four times a day, and he states their use has been attended with great success. Of this he thus speaks:—

"Now several questions will naturally arise in the minds of my readers; and the first of these will be, are these all the cases of Phthisis and Asthma you have had under your care since you hit on this method of treatment; in other words, [since you mention nothing but success as being attendant on your plan, at any rate as far as Phthisis is concerned] do you mean to tell us that with it you have

cured or relieved all of Phthisis and Asthma that have come before you since you possessed it? Most certainly not:—a goodly majority, rather above three-fifths, but certainly not all, and as to phthisical cases, they were, with two or three exceptions, in which cavities appear to exist, all in the early stages. Then, did you rely solely on this Endosmotic treatment, or did you accompany it with any other? I relied upon this to effect direct good, but I have always, at the same time, endeavoured to bring about indirect good through the medium of the constitution, by means of tonics, alteratives, change of air, and the other methods usually had recourse to, to improve the constitution."

Many persons will differ from the author as to the relative importance of this means, and the more general treatment he employs at the same time; but few can object to afford the extent of its efficiency a fair trial. As dates are every thing in estimating the power of proposed remedies for consumption, it is as well to observe, that the author's experience of this method had not extended, when he wrote, over a much longer space of time than a year.

A COMPLETE COURSE OF METEOROLOGY. By *L. F. Kaemtz*, Professor of Physics at the University of Halle; with Notes, by *Ch. Martins*, Supernumerary Professor of Natural History to the Faculty of Medicine, Paris, and an Appendix by *L. Lalanne*, Translated with Notes and Additions, by *C. V. Walker*, &c., &c. Fifteen Plates, pp. 598. London, 1845. Bailliere.

METEOROLOGY is one of those branches of natural science that especially demands the study of the medical man, from the well-known and acknowledged influence which the varying conditions of the atmosphere have on the production and diffusion of many diseases. During the present century the relations, that unquestionably exist between the origin of certain epidemics and an oscillatory or *feverish*, so to speak, state of barometric phenomena, have been far too much overlooked; and much is it to be desired, that more attention had been uniformly paid to the subject. That the character and type of many diseases—those more especially of the class Pyrexiæ—are so materially modified by the changing conditions of the air around us, as to require a very different treatment in different years, will be admitted by all practitioners of experience. The writings of Sydenham, more particularly, have taught physicians to appreciate the importance of what he calls the "medical constitution" of different seasons. The subject is one of great practical interest, although it must be confessed that allusion is rarely made to the operation of this agency in modern publications.

The present work contains a large amount of information on most of the topics that are usually considered to appertain to Meteorological Science. The first chapter is occupied with *Considerations on the Range of Temperature in general*; the second treats *Of Winds*; the third of *Aqueous Meteors*; the fourth of the *Distribution of Temperature on the Surface of the Globe*; the fifth of the *Weight of the Atmosphere*; the

sixth of the *Electric Phenomena of the Atmosphere;* the seventh of the *Optical Phenomena of the Atmosphere;* the eighth of *Aurora Boreales;* and the ninth and last, of what are called *Problematical Phenomena*—such as showers of blood, of sulphur, animals, &c.; shooting stars, and meteoric stones, &c., &c.

In selecting our extracts, we shall endeavour to keep in view those meteorological subjects that have a more or less immediate reference to animal life, more especially to that of man.

After giving a series of interesting tables to shew the *mean temperature of the atmosphere* at all hours of the day, during the twelve months of the year as observed at four different places, viz., Halle, Gottingen, Padua, and Leith, our author makes the following instructive remarks:—

"These tables shew that there is a *maximum* and a *minimum* of temperature on each day. The *minimum* occurs some little time before the rising of the sun, the *maximum* about two o'clock in the afternoon; a little sooner in winter and a little later in summer. The majority of philosophers admit that the moment of the rising of the sun is that at which the temperature is the lowest: but if we deduce from observation a formula, independent of the trifling errors of reading, which are almost inevitable, we shall find that the *minimum* occurs about half an hour before the rising of the sun, at the time when this body is yet 12° beneath the horizon. This rule, which is only applicable to our climates, varies in different seasons. In autumn and in winter the *minimum* coincides with a depression of 18° below the horizon, and in summer with 6° only.

"When the sun is above the horizon, it acts upon the earth and the lower strata of the atmosphere with greater power, as its angular height is greater. One portion of this heat penetrates into the soil, the other is lost by radiation towards the atmosphere and celestial space. Before mid-day the earth receives, in every instant of time, a quantity of heat, exceeding that which it loses by radiation; and its temperature is raised. This effect continues also for some time after the sun has passed the meridian, hence it follows that the maximum takes place some hours after the time of noon. While the sun is sinking toward the horizon, its action becomes less powerful, and the loss by radiation exceeds the gain by absorption. The heat diminishes the more rapidly as the sun is nearer setting. As soon as it has disappeared, the calorific source no longer existing, all the acquired heat radiates towards celestial space, the temperature falls, and would fall still lower, if the portion of the heat, which had penetrated into the superficial layers of the soil, did not return to the surface, by virtue of the conducting power of the earth. The lowering of temperature continues until morning announces the return of the sun, which again heats the regions that it illuminates." 20.

As the warmest time of the day is about an hour or two after noon, (when the sun has attained his highest elevation,) so the hottest month of the year is July, or that which succeeds to the Summer Solstice. The reason of this well-known fact is that, in the course of the preceding months, the air and earth have already become warmed, so that the mere continuance of the same thermometric temperature will have the effect of raising it by a few degrees. Moreover, the nights at this period of the year, are very short; and the earth therefore loses comparatively but little caloric by radiation during the absence of the sun.

The mensual heat falls at first slowly in August, then rapidly in September and October, and descends to its *minimum* in the middle of January. From that period, its rise is slow until the beginning of April,

in which month, and in May, it becomes much more rapid; it then goes on less rapidly to the end of July, when it attains its *maximum*. The amount of difference between the *maximum* and *minimum* degrees of temperature is always less in small islands, and on the western shores of continents, than elsewhere.

Winds.—We need scarcely say that these phenomena are always caused by a disturbance in the equilibrium of the atmosphere, in consequence of differences of temperature in different regions, or localities.

"*If two neighboring regions are unequally heated, there is produced in the upper strata, a wind blowing from the hotter to the colder region; and, at the surface of the soil, a contrary current.*

"This is the cause of the winds that we observe. The little experiment which follows, and which is due to Franklin, very well represents what takes place in the atmosphere. Open in winter a door communicating between a hot and a cold room, there will be two currents: the one above, and directed from the hot to the cold apartment; the other below, and in a contrary direction.

"To be convinced of this, it is only necessary to place two tapers by the door, the one high up and the other low down; the flame of the former will be directed from within outwards, that of the latter in the contrary direction. Sometimes these two currents exist above and below a pane of glass when imperfectly puttied in; and we observe, in winter, that a thicker layer of ice is accumulated at its lower part. In a chimney and in a lamp-glass an ascending current is kept up, which feeds the flame; and this current is stronger as the sides of the chimney-funnel or the lamp-glass are more heated." 34.

The interesting phenomena of the morning sea-breeze and evening land wind in tropical countries are readily explicable in a similar manner.

It is a curious but well-ascertained fact that, in the upper regions of the atmosphere within the tropics, there is almost always a westerly current of air: in the Northern hemisphere it is S.W., and in the Southern it is a N.W. wind. The heated air that is continually rushing from the equatorial regions towards the poles, is directed westward by the rotatory motion of the earth. As the current arrives at the higher latitudes, it loses its velocity and heat, and descends about the 30th parallel of latitude. This is the origin of the S.W. winds, which prevail, even as far as the Pole, in the northern hemisphere—more especially over the Atlantic ocean. They blow with so much regularity, that the voyage from America to Europe is almost always much more rapid and easy than the return. The prevailing winds in Europe are S.W. and N.E.—the former arising in the manner which we have just mentioned; and the latter being produced by the current from the colder regions of the north-eastern shores of Russia towards the warmer regions of the south-western shores of our Continent.

In connexion with the subject of the *temperature* of the atmosphere, we may here introduce the following remarks on its *humidity*:—

"In January, the coldest month of the year, the quantity of vapour attains its *minimum*; at the same time, the relative moisture is at its *maximum*. In proportion as the temperature rises, evaporation becomes more active, and the quantity of vapor increases, at first slowly, because the east winds, which commonly blow during this season, bring dry air from the interior of the continent. However we must not deny, that the numbers for winter and spring differ probably much from

means furnished by a series embracing a greater number of years; for the latter winters have been warmer, and the springs colder than they generally are. So that the numbers corresponding to winter are too high, and those to spring too low. The quantity of vapour attains its *maximum* in July, the month in which the air is driest. At the approach of winter, when the heat diminishes, the quantity of water precipitated in the form of rain, dew, and hoar frost, greatly exceeds that which passes into the state of vapour. Its quantity, therefore, goes on diminishing, although the humidity is continually increasing, and is greater in November and December than in the month of January. This is the origin of the damp cold which characterises these two last months." 92.

Westerly winds are always, it is well known, much moister than easterly ones; the former come to us charged with vapour from the Atlantic, while the latter proceed from the interior of the continents of Europe and Asia.

Weight of the Atmosphere; Cause of Storms, &c.—Every one associates in his mind the Barometer with the idea of a weather-glass; and properly so, to a certain extent: because oscillations of this instrument, indicating as they do changes in the pressure of the atmosphere, usually precede or accompany changes in the weather. But let it be remembered that changes in the one are not necessarily or inevitably associated with corresponding changes in the other. The primary use of the Barometer is to point out the degree of the atmospheric pressure in the place where the observation is made, and its oscillations indicate certain changes in the amount of that pressure. Now, as these changes are almost always occasioned by the varying conditions of the atmospheric temperature in different columns of air, a secondary use of the instrument may be said to be to point out the differences of temperature between two places situated at considerable distances—just as a Differential Thermometer indicates the difference of temperature between two points very near together.

The following position therefore is one that suggests many curious considerations:—

"*When the barometer falls in a country, it is because the temperature of this country is higher than that of the neighboring countries, whether because it is heated directly, or because these countries are cooled; on the contrary, the rise of the barometer proves that this country becomes colder than those which surround it.*" 263.

Keeping this principle in mind, we can understand how it is that, whenever the Barometer oscillates a great deal, the temperature and weather always experience extraordinary variations at some part or another of the globe—at a greater or less distance from the spot where the observations are made. A few examples in illustration of this, may be interesting:—

"About Christmas, in the year 1821, the barometer in Europe experienced an extraordinary fall. It was followed by a very mild winter in Paris, and in the other cities of west Europe; the mean temperature of January and February were higher by several degrees, than the general mean. In the United States, on the contrary, the winter was very severe; the current of the *Gulf-stream* was directed towards places which it does not usually visit. In Persia, according to Fraser's account, the winter was very cold; as it was also in Africa, where the plains of Kordofan were covered with a bed of snow, which disappeared, it is true, very rapidly. At Paris, the following summer was drier and hotter by

several degrees than usual. But, whilst the dry winds regained their sway in Europe, moist and violent winds constantly blew in India; at Bombay, 83·7 centimetres of rain above the mean fell; and in Kordofan, also, the Turkish army suffered much from continual rains.

"Something analogous occurred in 1824 and 1825. The terrible inundation of the Rhine in the autumn of 1838, the overflow of the Neva at St. Petersburg, the gales from the S.W., which, according to the observations of Munke and Schubler, took place in Schlesvig, and in all Holstein, are a proof of this. The barometer oscillated incessantly, and the rains were so abundant that every where, but principally in south Germany, springs burst forth in the streets and squares of the towns. In the same year the mean for the winter months was very high. In Iceland, on the contrary, according to Thorstensen's observations at Reikiavig, the mean of December was several degrees below the ordinary mean, and the barometer was very high, whilst it was very low at Copenhagen. This year, which was so rainy in Europe, was very dry in India; for at Bombay the quantity of rain was 118 centimetres below the mean. In Africa, it appears that there were violent gales; for, in the night of January 19th, 1825, the English ship *Clyde*, being 100 myriametres from the coast of Africa, was covered with fine sand, which the east winds had brought from the desert. In east Africa, Ruppel experienced violent storms: phenomena which are very rare in these countries, as may be discovered from the fear of the inhabitants. Ley experienced the same thing in Upper Egypt. In the following summer, all the north part of tropical Africa was a prey to excessive drought, and the inundation of the Nile having failed, there was a complete dearth.

"The same disturbances were manifested on the two shores of the Great Ocean. In California, there were violent tempests during the autumn, as there were also at the Sandwich and Phillippine Islands. But the trade-winds were no longer blowing regularly over the sea. These facts prove that the anormal phenomena of Europe are not isolated, but are propagated over the whole circumference of the globe." 323.

Besides these instances, we may mention that the winter of 1829-30 was one of the coldest that had occurred in Europe for a long time: yet, it was so mild in America that there was no ice on the west coast—a circumstance which permitted Captain Ross to advance so far to the north. The reverse of this was the case in the winter of 1833-4. It was unusually mild with us, and had been preceded by a stormy tempestuous autumn. In India, Brazil, and Guiana, the drought was so great that very many of the inhabitants died of famine. In China, there were terrible inundations; on the contrary, the rising of the Nile was quite insignificant. In the United States and in Persia the winter was extremely rigorous; and it was during this season that Captain Back encountered such terrible cold in the Polar regions.

The general conclusions, which Dr. Kraemtz has drawn from his researches on the subject, are these:—

"Thus, then, a great fall of the barometer, or frequent oscillations of the column, prove that there are meteorological disturbances on the surface of the globe, and conflicts of opposite winds, which change the weather. Further, when the barometer rises and falls rapidly, we may affirm that the weather will be variable for a long time. If we knew the weather that prevailed on the rest of the globe, we might conclude that which could be expected. We ought to know, when the barometer is low, whether the cold is very intense in America or in Asia. In the first case, the west winds will bring rain; in the second, the east winds will bring cold. However, on studying in the spring the barometer and the direction of the gales of wind, we may establish certain probabilities. If

the barometer has fallen considerably during S.W. winds, and then rises slowly; if the wind passes from the West to the N.W., and remains in that direction; it is a proof of the predominance of west winds, and the weather will be influenced by them; we saw this in 1833. If the barometer, on the contrary, rises very quickly, and if the wind passes in a short space of time from the S.W. to the N.E., where it stops, we may expect a prolonged cold, like that which prevailed in 1829." 326.

In the Chapter on Atmospheric Electricity, there is the following description of what have been called *fulgurites*, or *fulminary tubes* :—

"When lightning falls upon sand, its course is often marked by tubes, called fulminary tubes, or *fulgurites*. Although they have long been noticed, it is only since Henzen observed them in the sandy hillocks of Holstein that they have been attentively studied. Blumenbach was the first to attribute them to lightning; Fiedler carefully studied their nature and their mode of formation. They are generally composed of tubes of very different lengths and diameters, which contract toward their lower extremity, and terminate in a point; they are generally sinuous, and more or less ramified. Vitrified within, their exterior is covered with agglutinated grains of sand; the vitrified parts of which are of a reddish, or even greenish pearl grey. Their diameter is from 1 to 90^{mm}; the thickness of the sides, 0^{mm}, 5 to 24^{mm}. Their length sometimes exceeds 6^{m}, and the ramifications are from 2 to 30 centimetres long. All fulminary tubes with thick sides have, according to Fiedler, rough surfaces, and are divided into fragments of from 5 to 100^{mm} long. The tubes, whose sides are thin throughout their length, have a smooth surface, and are regularly cylindrical; they present no transverse fractures. All the fulgurites hitherto examined are directed towards reservoirs of water, or bodies which are good conductors of electricity.

"Direct observations have shewn that these fulgurites were due to the action of lightning. Thus, Pfaff received a tube from the island of Amrum. Some sailors saw the lightning fall upon the sand; they dug and found a tube 6^{mm} in diameter, blackened within by the carbon of the burned vegetables." 355.

The *Heat-lightnings*, that are so frequently observed on serene evenings in summer, are regarded by most meteorologists, and by our author among the number, as the reflections of the lightning of distant storms. "Every one," says he, "may convince himself that lightnings are reflected through the air with great intensity on a dark night. When a storm is in the west, and the rest of the sky remains serene, we have only to turn our back to the storm to see the lightning reflected in the east part of the heavens; and yet, in this case, the conditions for reflection are far less favourable than in the preceding example."

It is to be observed, that, whenever these *heat*-lightnings are more than usually frequent and brilliant, the days are generally heavy and dull, betokening the approach of a storm, and the Barometer indicates a tendency either to rise or fall. In the majority of instances, we shall find that a severe storm has been experienced at a greater or less distance from the spot where the phenomena were observed. For example :—

"In the middle of the month of August, 1832, heat-lightning was very frequently observed at Geneva; during the day the sky had a dull and dim appearance. On August 16, the subject was actively discussed in the *Société de Physique et d'Histoire Naturelle*. After the sitting, heat-lightning illuminated the whole of the north horizon, as though to put to the test the opinions that had been advanced. During the day the sky had been dull; toward the north I had perceived *cumulo-stratus* about the horizon; and after sunset there still remained

clouds in the sky. Some days after, the newspapers were filled with the account of ravages caused by storms in Baden, Wurtemberg, and Bavaria: even in the country of Vaud, the lightning struck several houses. If the newspapers had also mentioned the storms that had occurred in this neighbourhood, without causing mischief, we might have seen that there were some even closer still." 375.

Among the electrical phenomena of the atmosphere our author enumerates *hail*—the formation of which meteor has long been, and still remains, a subject of difference of opinion. How, for instance, are we to explain the circumstance that hail-storms are infinitely more common during the day than during the night? and that, in the majority of instances, they are observed in warm weather, at, or soon after, noon, about the period of the greatest diurnal heat? Then again, how comes it that certain places are ravaged by hail-storms almost every year, whilst adjacent localities are almost entirely spared? These, and many other points connected with the history of this atmospheric phenomenon, are far from being well understood.

Aristotle and Lucretius have said that a loud noise may often be heard when a cloud, charged with hail, approaches the zenith. This observation has been confirmed by several modern writers; while others have either questioned, or wholly denied its accuracy. As we have already mentioned, hail-showers are frequently very limited in their extent: at a short distance from where the hail fell, perhaps not even a puff of wind has been felt. The following is a curious example of this circumstance:—

"The storm commenced in the morning in the south of France, and in a few hours reached Holland. The places destroyed by the hail formed two parallel lines from S.W. to N.E.; one was 70 and the other 80 myriameters long. The mean width of the west line was 16, and that of the east line 8 kilometres. The space comprised between the two lines, the width of which was 2 myriametres, was spared; there merely fell a heavy rain. It also rained much on the east and the west of the two lines. The storm was preceded by an obscuration of the light of day; it travelled about 66 kilometres per hour, and its velocity was the same in both the zones. In the west zone the hail fell at La Rochelle, after a storm that had lasted all the night; at 17^h 30^m, in Touraine, near Loches; at 18^h 30^m, near Chartres; at 19^h 30^m, at Rambouillet; at 20^h, at Pontoise; at 20^h 30^m, at Clermont, in Beauvoisis; at 21^h, at Douai; at 23^h, at Courtrai; at 0^h 30^m, and at Flessingue, about 1^h 30^m. In the west zone, the storm reached Artenay, near Orleans, at 19^h 30^m; Andouville, in La Beauce, about 20^h; the Faubourg St. Antoine, Paris, 20^h 30^m; Crespy, in Valois, about 21^h 30^m; Cateau-Cambresis, 23^h; Utrecht, 2^h 30^m. At each place the hail only fell for seven or eight minutes, but with so much violence, that all the harvests were cut to pieces. Of all the great hail-storms, there is not one of which we have such exact information, and yet it is still insufficient; thus the direction of the wind, and that of the clouds before and after the storms, and on the two sides of the space where the hail fell, have not been pointed out." 384.

According to Dr. Kraemtz, the production of hail—which, it is to be observed, is almost invariably preceded by oscillations in the barometric state of the atmosphere—is attributable to the conflict of two opposing currents of wind from the north and south, (the latter charged with moisture)—the greatest fall taking place where the shock is the most violent. After a hail-storm, the weather—which usually has been hot for some time before—often remains unsettled for weeks; very frequently it is followed with cold. The rise of the barometer proves that the north wind

generally obtains the predominence; and the more so, as, in melting, the hail absorbs a very notable quantity of heat.

"The conflict of opposite winds," our author remarks, "also explains certain peculiarities of storms, accompanied by hail. Every thing that tends to put the air in motion favours the formation of hail. This is why it is more common in the mountains, where the rapidity of the atmospheric current increases in the valleys. If the march of storms were known by observations embracing a series of several years, by comparing local peculiarities, we might discover why certain countries are frequently ravaged by hail, whilst others are almost entirely spared. Narrow valleys, surrounded by high mountains, as the Valais and the vale of Aoste, are rarely visited by hail: these valleys are so warm, that the hail-stones melt before reaching the ground. Moreover, the high mountains that hang over them prevent the conflict of opposite winds, or limit it to the high regions of the atmosphere, which prevents the hail-stones acquiring any considerable volume. But, at the mouth of valleys, in the plain, storms, accompanied with hail, are the more violent (principally on the south side of the Alps), as the south winds are arrested by the mountains, while the north winds, when they have traversed them, rush impetuously to the plain." 391.

With the following quotation on the curious subject of *Terrestrial Magnetism*, we close our notice of this interesting volume:—

"Every where, on the surface and in the interior of the globe, the magnetic needle takes a determinate position; this position varies in each country of the earth: as we advance, proceeding directly to the west, we see that it increases, and attains its *maximum* in the Atlantic Ocean. From this point, the western declination diminishes; and at the east of the United States, the needle points exactly to the north pole; and consequently the declination is nothing; more westward, the declination becomes east. If we had gone toward the east, the west declination would have diminished; it would be nothing in the east of the Russian empire; and then east, if we had continued our course towards the east.

"In general, if, under any parallel, we take the circuit of the globe, we shall find a point where the needle is directed toward the north; afterwards the deviation becomes westerly, attains its *maximum*, and then diminishes, until it is nothing: thus the declination varies greatly. If we make our experiments under the equator, and repeat them every five degrees, we shall find that the difference between the *maximum* eastern and the *maximum* western declination increases as we approach the poles of the earth. Thus, in Greenland, the west declination is so great that the needle points to the west; and Parry found a point, in the west of Greenland, where the north pole of the needle was turned to the south.

"The dip presents similar differences; in our countries it is northern, that is to say, the north pole is directed downward, and forms an angle of 70° with the plane of the horizon. In proportion as we advance toward the south, the needle approaches the horizontal direction, and, in the neighbourhood of the equator, it is altogether parallel to the horizon: the dip is, therefore, nothing. On passing into the southern hemisphere, we see the south pole of the needle dip, and the more so as we approach the south pole; going toward the north, the contrary would have been observed: thus, in one of the hemispheres, the dip is northern, and, in the other southern. These two hemispheres are separated by a line of dip, upon all points of which the needle is horizontal: this line, which cuts the equator in different points, and rises alternately into each hemisphere, is called the *magnetic equator*." 548.

Medico-Chirurgical Transactions, published by the Royal Medical and Chirurgical Society of London. Volume the Twenty-seventh, (the Ninth of the Second Series,) 1844. Continued from page 32.

XVI. On Obstructions of the Branches of the Pulmonary Artery. By *James Paget.*

The obstructions treated of in this paper, are those produced by the coagulation of blood during life in the branches of the pulmonary artery. They are not of rare occurrence, and, the author observes are always important, for they are sometimes the sole or chief cause of death, and must in all cases seriously affect the progress of the diseases with which they are associated. Yet they have hitherto scarcely attracted attention, and in the only paper which he can find expressly treating of them (one by M. C. Baron, in the Archives Générales de Médecine, Paris 1838) there are but four cases related, and these give a very imperfect account of the nature of the disease and of the circumstances in which it occurs.

"From the arrangement of the pulmonary arteries, between which there is no anastomosis, except in their capillaries and smallest branches, it results that whenever the flow of blood through the capillaries of any part of a lung, is prevented, there must also be a stagnation of the blood in all the branches from which those capillaries are derived; and in these circumstances, the blood coagulates in the vessels, and passes through various changes." 163.

Now these conditions are present in several diseases;—First, in *pulmonary apoplexy*, especially in that form of it in which the blood collects in a defined and compact dark mass. In all, or in a great majority of these cases, the branches of the pulmonary artery leading to the seat of effusion are blocked up by coagula, which present the distinguishing characters of those formed long previous to death.

Secondly.—The capillary circulation is usually obstructed or much hindered in the advanced stages of pneumonia, and the arrested blood coagulates in those branches which correspond to the inflamed and consolidated portions of lung. So far as the author has seen, "the coagula in these cases are not sufficiently large to fill the vessels; circulation enough, therefore, may go on to prevent gangrene; but still, such permanent, though imperfect, obstacles to the passage of blood must materially impede and endanger the recovery of the diseased part, and no doubt the formation of these clots often precedes the complete obliteration of the pulmonary arteries, when, after partial recovery from pneumonia, the diseased portion of the lung has healed and contracted. Sometimes, indeed, coagula thus formed in pneumonia are fatal. They were so in one of the cases mentioned by M. Baron. A patient of M. Louis' was suddenly seized with symptoms of asphyxia during convalescence from pneumonia: he died in five or six hours, and 'nothing could be found to explain his death, except some soft non-adherent clots, which obstructed the cavity of the pulmonary artery.'"

Thirdly.—When the matter of medullary cancer or of softened scirrhus passes into the blood, and, circulating with it, is stopped in the lungs, the branches of the pulmonary artery may be to a great extent filled by it and by coagulated blood or fibrine mixed with it. Mr. Paget relates a case which affords a good example of this fact. It was the case of a woman affected with carcinoma of the liver. On examination of the body, it appeared that the cancerous substance had been conveyed with the blood from the liver to the lungs, where, being arrested and obstructing the minute vessels, it had permitted fresh substance with blood to accumulate behind it. Some other cases in which similar appearances were found in the lungs are also mentioned.

Fourthly.—The branches of the pulmonary artery are often blocked up by clots formed during life in those who die with great œdema of the lungs. In some of these cases the coagulation is probably consequent, as in pulmonary apoplexy from disease of the left side of the heart, on the obstruction to the passage of the blood through the capillaries. But the author is of opinion, that in general some further condition is necessary, and he gives two cases of coagula occurring with œdema of the lungs, in one of which sufficient evidence of a morbid state of the blood is afforded by the signs of its early decomposition after death.

Mr. Paget remarks that, in these four classes of cases, "the coagulation of the blood in the pulmonary arteries may be regarded as a secondary phenomenon; for it usually appears as the consequence, either chiefly or entirely, of the obstruction in the capillaries. Whenever that obstruction is complete, and prevails through the whole of both lungs, death by asphyxia must ensue before the arrested and coagulated blood can undergo any structural changes; and such changes can take place only when the capillary circulation can be carried on in some parts of the lungs, at the same time that in others the blood is stagnant."

The author believes, also, that in some other diseases under the same essential conditions similar coagula are often formed. But there are other classes of cases in which their formation appears to be a primary disease, or in which at least it cannot be regarded as the result of mere obstruction in the capillaries. Of these he has observed three examples. The first is the case of a woman, 29 years of age, who was admitted into St. Bartholomew's Hospital, May 5th, 1843, with symptoms of rheumatism, attended with a good deal of depression of the system, and a rapid pulse and respiration. After a few days the abdomen became distended, and rather painful on pressure; on the next day she complained of great tenderness in the right iliac region; and on this day also (May 9th) the præcordial region was found tender, and on auscultation, a distant bellows sound was heard at the base of the heart accompanying the systole.

"On the 10th, the cheeks and forehead were covered with an erysipelatous blush, and numerous red acuminated papulæ had appeared upon the chest, the urine was very irritating, and smelt offensively, sloughs had begun to form upon the sacrum, and the weakness and depression were increased. On the morning of the 11th, after passing a comfortable night, she was suddenly seized with a sensation of great tightness in the præcordial region, violent palpitation of the heart, and the most urgent dyspnœa. The attack lasted for an hour, and then she returned to nearly the same state as she had been in before it; but from this time she sank more rapidly. Upon auscultation, no

respiratory murmur was heard below the right breast, and it was dull on percussion ; the habitual dyspnœa became greater, the sloughs on the nates and sacrum extended, the abdomen became again tympanitic and tender, especially about the right iliac region, she vomited several times, and died in the afternoon of the 13th."
176.

On examination 40 hours after death, all the blood which appeared in the ordinary course of the dissection was found either fluid or coagulated in soft black masses. The pericardium contained half an ounce of fluid, and there was a few slender adhesions between the trunks of the larger vessels. No particular disease of the heart and principal vessels. A small quantity of fluid in each pleural sac. Lower lobes of both lungs œdematous and gorged with blood. Trachea and bronchi healthy. "Nearly half the branches of the pulmonary artery, from those of the second order, to those of the fifth and sixth (and probably to yet smaller branches,) were blocked up by old coagula of blood. These were cylindrical, soft, and grumous, and in colour were a mixture of pale pink and dirty greyish white, with spots and blotches of deep crimson. They were not more numerous in one lung than in the other, and were irregularly scattered through all parts of each. They did not quite fill the vessels which contained them, but at various parts they adhered closely to the walls. The trunk of the pulmonary artery, and many of the branches which did not contain coagula of the kind just described, contained fluid and softly clotted black blood." Abdominal and pelvic organs healthy.

In the next case, a woman, 70 years of age, who had suffered for five weeks from a bad cold, was taken into the hospital in a declining state. On the day after her admission, she seemed to improve a little, but next day she sank rapidly, and Dr. Burrows "remarked an extreme hurry of the circulation, with feebleness of the pulse and great prostration of strength, very similar to those observed in the preceding case." On examination of the body 36 hours after death, there was no other particular disease except a small patch of compact pulmonary apoplexy with some diffused apoplexy around it, at the anterior and lower border of the left lung ; and "in each lung, one of the superior, and one of the inferior main branches of the pulmonary artery were blocked up by a large, firm, mottled, clot of blood, which, from itself as a trunk, sent branches into two or more of the next order of branches of the artery. The colours of the clots were black, deep-crimson, rusty, pink, and yellowish, in various irregularly mingled shades ; they were moderately firm, of nearly uniform consistence throughout, and capable of being rubbed into a thick grumous substance ; they adhered so firmly by parts of their surfaces to the adjacent walls of the vessels, that they could not be smoothly removed. The branches of the largest clots did not extend far into the arteries, but terminated abruptly in the arterial ramifications immediately proceeding from those in which they lay. But beyond their terminations, many smaller branches of the pulmonary arteries in all parts of the lungs contained short, firm, dry, mottled, and adherent clots, variously coloured. None of these was long or much ramified ; none was continued through more than two branches ; and many of them were not more than half or three quarters of an inch long ; some were even shorter, and lay like bits of larger clots upon the walls of the vessels. They had all the same characters as those

already described; and the portions of lung adjacent to and beyond them, were not different from the rest.

"Moreover, in several of the larger branches of the pulmonary artery, there were appearances of clots of blood formed like those just described, and having been still further altered and organized. These were pale, semi-transparent, soft, and flattened narrow bands, attached firmly to the walls of the artery, and presenting all the characters of the organized clots which I have sometimes seen adhering to the walls of divided arteries. They were from one quarter of an inch to an inch in length, and about one-tenth of an inch wide; a few were fixed in their whole length, to the walls of the artery, but most of them by their ends only, so that a probe could be passed under them. Among the clots there were all gradations, between those last and those first described; and in one instance, one of the largest of the more recent clots was continuous, with a flat, semi-transparent, and adherent portion, like those which had existed for the longest time.

"The branches of the pulmonary arteries which were thus obstructed, were smooth and polished internally, but in many places had fine, scattered, and grouped grains of yellow deposit in their coats. They were all of natural size; and the pulmonary veins were healthy."

The cavities of the heart were dilated and hypertrophied, and contained adherent coagula. The mitral and aortic valves were thickened, but able to discharge their functions. Numerous yellow deposits in the coats of the aorta. The large veins and the systemic arteries, as far as they were examined, were healthy.

The third case, was that of a young girl who had long lived in the miseries of poverty and prostitution, admitted into the hospital for gonorrhœa, pale, haggard, and scarcely able to walk. After a month, signs of pleuro-pneumonia came on and she soon died. We have not space for the minute particulars given of the post-mortem examination.* It is sufficient to remark that, in the lower lobes of both lungs, all the pulmonary arteries from the origin of the main branch to the most distant branches were full of old fibrinous coagula, and that there were also about twenty firm and compact masses of *pulmonary apoplexy* of very irregular form. The clots in this last case were distinguished by being laminated, as if formed by the deposition of successive layers from the wall towards the axis of the artery. In all the others, the particles of the clot were irregularly arranged: they were throughout various in both colour and consistence. Some were partially softened, indicating that the blood had died before the general death of the body; others, in which the blood had, probably, become further organized, had acquired firm adhesions to the walls of the vessels; and in the last case but one, it was evident that the clots were fully organized, and had acquired organic connexions with the adjacent parts.

"In this respect the case is peculiarly interesting, for it proves that blood, though coagulated in circumstances of disease, is yet capable of further organi-

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* In this case there were only two valves in the pulmonary artery; they were both diseased.

zation, when placed in conditions compatible with the maintenance of its life; and further, that the coagulation of the blood in the large pulmonary arteries, is not necessarily either the cause or the attendant of fatal disease; for several weeks must have been occupied in effecting the complete organization to which these clots had attained." 187.

Mr. Paget's character as an accurate observer, and the little attention hitherto bestowed on ante-mortem clots in the branches of the pulmonary artery, have led us to quote rather largely from this paper, though we do not see that any important practical inferences can be drawn from it, and the author admits his inability to connect the symptoms presented by the three patients whose cases we have given with the morbid appearances. It appears to us that, in the two latter at least of these cases, the blood had from some cause become morbidly altered, and rendered unfit for circulation; and, as a natural consequence, that obstruction had taken place in the lungs, the organs which usually suffer when the blood is contaminated by pus in phlebitis, or by the germs of cancer in malignant disease. This paper will however be useful in directing attention to the condition of the pulmonary artery in cases of fatal disease, and further investigation will show the degree of importance to be attached to the clots which form in its branches during the close of life.

XVII. On the Composition of the Meconium, and of the Vernix Caseosa, or lubricating Matter of the New-born Infant. By *John Davy*, M.D., F.R.S.

The microscopical character of meconium is very distinctive, and well displays its compound nature: it exhibits a confused mixture of globules, plates and molecules. The globules about $\frac{1}{3000}$th of an inch in diameter, are very abundant, and form a principal part of the whole. Judging from their form and size, their insolubility in water and alcohol, they may be inferred to consist chiefly of mucus. The plates which are tolerably abundant, are of two kinds. One kind is of irregular form, somewhat granular, varying in size from about $\frac{1}{2000}$ to $\frac{1}{1000}$ of an inch in diameter, insoluble in water, hot or cold alcohol, the dilute acids and alkalis—like epithelium scales, which the author believes them to be. The other kind are of a regular kind, chiefly rhomboidal, of great thinness, and perfect transparency, insoluble in water, acids, and cold alcohol, but readily soluble in hot:—properties indicative of cholesterine. The molecules vary in size from $\frac{1}{8000}$ to $\frac{1}{20000}$ of an inch in diameter; and being insoluble in water, and soluble in alkaline ley, may be considered as consisting chiefly of fatty matter.

Besides these ingredients, to which the meconium owes its thick consistency and viscid nature, there is another portion from which the mass derives its colour and taste, and probably its power of resisting putrefaction, and which seems identical with the colouring and sapid matter of bile, being soluble in water and alcohol. The specific gravity of meconium exceeds that of water; it sinks in a saturated solution of common salt of the sp. gr. 1148. The quantities of meconium which the author has obtained have been too small to admit of accurate analysis; but in

specimen obtained from a healthy child immediately after birth, the proportion of ingredients was determined, and the results per cent. were about as follows:—

23·6	mucus and epithelium scales.
·7	cholesterine and margarine.
3·0	colouring and sapid matter of bile and oleine.
72·7	water.
100·0	

These proportions the author believes may be considered pretty correct. A portion of the same meconium was incinerated. It burnt with a bright flame, and ·69 per cent. of reddish ash, chiefly peroxide of iron and magnesia, with a trace of phosphate of lime and common salt.

The vernix caseosa, under the microscope, is found to be composed of granules, plates, and molecules; the plates constituting the principal part. These have the properties of epithelium scales, the granules, those of fatty matter, as also the molecules. The plates are insoluble, both in weak acids and in alkaline leys, and in cold and hot alcohol; are of irregular form, varying in size from about $\frac{1}{666}$ to $\frac{1}{1000}$ of an inch in diameter, and very thin. The vernix is apparently lighter than water, on which it floats; but this is owing to the air entangled in it. Of a butteraceous consistence in its ordinary state, at a temperature of 60°, it hardens on reduction of temperature, and becomes almost semi-fluid when its temperature is raised to 100°,—admirably adapting it for a lubricating substance in parturition.

A single specimen of the lubricating matter, of great purity, was found to consist of—

13·25	epithelium plates.
5·75	oleine.
3·13	margarine.
77·37	water.
100·00	

Dr. Davy remarks that, theoretically considered as regards the origin of the two substances treated of, the preceding results seem to point out distinctly, that both are excretions, the meconium chiefly derived from the liver, and the lubricating matter from the skin. He alludes to the opinion of Raspail, that a portion of the meconium consists of intestinal villi, but observes that he has sought in vain for the appearances which Raspail describes. Vauquelin and Buniva, after examining the vernix caseosa, were led to infer that it is not an excretion from the infant, but a deposit on its surface from the liquor amnii. Bichat rejected this view merely from the circumstance that no such deposit is found on the umbilical cord, or on the inner surface of the amnios, and came to the conclusion, which seems most just, that it is derived from the skin of the fœtus, and is a secretion similar to that which takes place after birth in many parts of the cutaneous system.

XVIII. ON PARACENTESIS THORACIS AS A CURATIVE MEASURE IN EMPYEMA AND INFLAMMATORY HYDROTHORAX. By *Hamilton Roe*, M.D. Oxon.

The author commences this paper by stating that the opinion very generally prevails amongst the most eminent members of the profession, that the operation of tapping the chest affords but little hope of curing either empyema or hydrothorax, and that therefore it should never be performed until the difficulty of breathing, caused by the pressure of the fluid, becomes so urgent as to threaten immediate death. The reasons assigned for this opinion are—"First, that the re-accumulation of fluid will commence immediately after its evacuation has been effected, and can be prevented by the action of the absorbents only; and, therefore, that we ought to rely upon them, in the first instance, for its removal. Secondly, that the operation itself is attended with very considerable danger. And, Thirdly, that the majority of those cases in which the operation has been performed, has terminated fatally."

After mentioning that Sir A. Cooper, Laennec, Stokes, and some others, speak unfavourably of the operation, the author remarks that "no modern physician or surgeon has recommended it as a curative measure." We should infer from this statement that Dr. Roe is imperfectly acquainted with the opinions entertained on this subject by the best modern practitioners, if he had not directly contradicted himself at page 214, by observing:—"It (the operation) has been recommended by many eminent physicians and surgeons on the Continent, in America, and in our own country—viz., Baron Larrey, T. P. Frank, Bell, Dr. Elliotson, Dr. Forbes, Dr. Copland, Dr. C. J. B. Williams, Dr. E. Harrison, the late Dr. Davis, and several others." We leave it to the author to reconcile these two statements. The fact is, paracentesis thoracis is not in such "very general disrepute" as the author would *in limine* lead us to believe, as he has himself shewn in the passage just quoted. The late Dr. Davis decidedly advocated this plan of treatment; and Dr. Watson, instead of waiting in cases of empyema until suffocation was threatened, advises, "whenever the effused liquid consists of pus, it should be let out."*

We must admit, however, that the opinions of the profession respecting this operation are sufficienly unsettled to warrant Dr. Roe in an attempt to estimate its value, and to lay down rules for its application.

In order to ascertain how far the objections to the operation were derived from the results which followed its performance, he states, that he has collected all the cases of this operation which had been published in the English language, between the years 1812 and 1832 inclusive.

These cases are arranged in a tabular form, and certain particulars are stated in separate columns, to enable the Society to form a judgment of the causes of the failure or success of the operation. The table includes 39 cases: of these 28 recovered, and 11 died. Encouraged by this result, Dr. Roe tapped all cases of empyema and hydrothorax, in which the means adopted did not after a few weeks produce a sensible diminution of the effused fluid, and he found the success attendant upon this practice to

* Medical Gazette, Vol. I., 1841—42, p. 249.

exceed his most sanguine expectations. Before describing these cases, he makes some observations in reply to the principal arguments brought forward against the operation. We shall notice the principal. It is said that the admission of air during the operation is attended with danger, and frequently renders it unsuccessful. The author admits that air readily enters the pleura—it occurred in all cases under his observation, but in none of them did it produce any permanently evil effect: in one instance only did it cause even temporary inconvenience. The air by its pressure on the lung produced dyspnœa, which was relieved by the air being pumped out with an ordinary syringe. Another objection which is noticed, is one advanced in a posthumous essay of the late Dr. Hope, viz., that all cases of empyema really curable, are curable without paracentesis. The author remarks:—

"This conclusion appears to have been drawn from the results of thirty-five cases of that disease, recorded in the paper just alluded to, in which the exhibition of mercury, continued until the patients had been brought completely under its influence, was followed by the removal of the fluid. Now without calling in question the existence of empyema in all these cases, or seeking for the proofs of its presence, I would ask, before I proceed to combat the objection, what is meant by the cure of empyema? If it be the simple removal of the fluid, I am not inclined to dispute the *possibility* of effecting so much by the power of mercury, for I have had many cases in which the symptoms of fluid in the chest have disappeared under its action: but this is not necessarily a cure; for the lung which has been compressed by the fluid is often left so altered in its structure, that it never again can perform its healthy function. But if it be meant, that in all curable cases of empyema, mercury, exhibited in the manner prescribed, will not only cause the absorption of the fluid, but the restoration of the lung to health, the experience I have had of the effect of that medicine in this disease, precludes me from subscribing to this assertion. I have had many cases in which it has failed to cause even the absorption of the fluid, and very many in which after effecting its removal, it left the lung in a condition very different from that of health; in a majority of the cases recorded in this paper, mercury had been freely exhibited before the patients came under my care; in several it was given by my own direction; in three, ptyalism was produced and kept up, but nevertheless the fluid was not absorbed. To justify the assertion that all curable cases of empyema may be cured by mercury, without paracentesis, or, in other words, that no case of empyema which cannot be cured by mercury is curable by the operation in question, it would not be sufficient to show that paracentesis had not succeeded in curing any case where mercury had failed, unless it were also shown that at the time of its performance no such changes had taken place in any of the thoracic viscera, as rendered a cure impossible. Indeed, I am unable to conceive how such an assertion could be proved, for even if the whole of those thirty-five cases, were perfectly cured, that is, not only that the fluid was removed, but that the lungs were restored to health and soundness—which is not alleged to have been the case—the point asserted would even then be rendered probable only, because other cases might still occur, in which mercury would fail; but it is not stated that these cases were so perfectly cured, and in the absence of evidence, or even any statement to that effect, we can only receive this assertion as the expression of the opinion of the late Dr. Hope, an opinion which we know to be contravened by the reports of many of the cases which have been published as cured. They state, that the shoulder of the affected side had dropped, that the chest was left contracted, and that the spine was deformed; facts which clearly indicate an accommodation of the bony parietes to a diminution in the size of the lungs, and lead

as to the inevitable conclusion, that the lungs, so far from being cured, were too much injured to expand to their former dimensions." 207.

The author gives two striking examples of the extent of mischief sometimes done to the lungs of patients said to be cured of effusions into the chest by absorption. One was the case of a woman, aged 37, whose left side was much flattened, dull on percussion, and without even the feeblest sound of respiration. She had suffered some years before death from an attack of pleurisy, of which she had been cured. On examination of the body, the left lung was found considerably diminished in size, impervious to air, condensed into a dry homogeneous mass, and retained in contact with the ribs by a thickened and almost cartilaginous pleura: no tubercles were found in the lungs. In the other case, it does not appear that the patient was considered to have been *cured* of a pleuritic affection. The lower two-thirds, however, of the right lung were adherent to the ribs and condensed into a dry mass from the effects of this disease. The writer thinks that these cases are more common than is generally supposed, and that "they show that patients may be sent out of an hospital, apparently cured of empyema and hydrothorax, because the fluid has been absorbed, but who must suffer all their lives from the loss of one lung, and they prove most clearly that absorption of effused fluid is not necessarily a cure."

After arguing the propriety of having recourse to paracentesis, when mercury carried to salivation has failed to cause the removal of the fluid, in order to prevent this serious injury to the lungs, Dr. Roe alludes to the opinion of Broussais and Dr. C. J. B. Williams, "that retention of pus, possibly of serum, for a long time in the pleura, leads to the development of tubercles in the lung of the opposite, or even of the affected, side," as affording an additional argument in favour of an early operation. He combats the opinion entertained by some medical men that paracentesis, though necessary in empyema, is wholly unnecessary in hydrothorax, because those cases which cannot be cured by anti-phlogistic means may be cured by generous diet and tonics, by the fact that Dr. Boyd, in the space of three years, at the St. Marylebone Infirmary, opened the bodies of 24 persons who died of hydrothorax, without tapping having been employed. The objections to paracentesis are reduced to this—"that it inflicts a wound; whilst in favour of it, it may be said, that in empyema it at once removes a noxious fluid, and does far less injury to the constitution than the absorption of purulent matter; that in both empyema and hydrothorax, it immediately relieves the lungs from the effects of pressure, and accomplishes that which internal medicines cannot, in the majority of cases, effect in weeks; and by its early employment, those irremediable changes already noticed are anticipated, and every chance is afforded for the complete restoration of the lung; that it removes that distention of the pleura, which paralyses the absorbents, and if inflammation be overcome by suitable remedies, it will effectually cure these diseases, provided the lungs are sound, and that without inducing any evil consequences."

The author mentions the mode which Nature often adopts for evacuating the fluid, by the pus making its way between the intercostal spaces and bursting externally, and also through the lung itself into a bronchial tube,

and an interesting case is given in which a cure was spontaneously effected by the latter method. The cases in which it is considered that the operation should be performed, are serous effusions forming so rapidly as to endanger life; cases of empyema; serous effusions in persons of delicate health after the usual treatment has failed or been neglected; and mechanical hydrothorax, for the purpose of relieving the difficulty of breathing and prolonging life. The author details a case of the latter disease in which life was certainly prolonged seven months by the operation. We find the following excellent remarks on the conditions of success:—

"Whether the operation shall materially assist in curing cases of simple pleuritic effusion, or afford merely temporary relief, depends on the time at which it is performed. To be successful, it is indispensably necessary that it should be employed before either the constitutional powers of the patient are too much reduced, or the thoracic viscera have undergone irremediable organic changes: for in the former case the absorbents cease to perform their functions, and, therefore, cannot prevent the re-accumulation of fluid after it has been removed; in the latter, a perfect cure is impossible. It is only when the lung is in a condition to expand to its full size, according as the pressure upon it is withdrawn, that the cure is effected without any visible alteration of shape in the diseased side. But when the operation is delayed till the lung has become atrophied, condensed, bound down by adhesions, or in any other way prevented from at once expanding sufficiently to meet the ribs, the shoulder becomes depressed and the side contracted, in order to bring the pleuræ into contact with each other: the body is then deformed, and the original capacity of the lung is very much diminished. When the lung is so much reduced in size that the pleura investing it cannot be brought into contact with the costal pleura, a cure is impossible: for a space must intervene between them, into which pus or serum will continue to be secreted, and the operation will be required again and again, till the patient dies from exhaustion. Under such circumstances, paracentesis cannot be looked upon as a curative measure, and, therefore, should only be employed to relieve distress of breathing." 220.

Dr. Roe attempts to fix the precise period after which the operation ought not to be delayed, which he makes about three weeks. We should have thought that the author's experience of this disease, and of its variable progress influenced by the state of the constitution and the action of remedies, would have shown him the futility of fixing upon any precise period for resorting to paracentesis. In several of the successful cases in the tables furnished by our author, the operation was delayed beyond three weeks. He states, however, that no case occurred in his own practice, in which, after a lapse of five or six weeks from the commencement of effusion, a patient was *perfectly cured*. The changes produced in the lung after this period, and sometimes before it, were irremediable. Dr. Roe gives the credit of the invention of the grooved exploring needle to Sir B. Brodie; but Dr. Watson ascribes it, and we believe justly, to the late Dr. T. Davies, of the London Hospital. The author advocates the plan of closing the wound after the operation, and repeating it if necessary, in preference to making a fistulous orifice by introducing a piece of elastic gum catheter, a point in which we decidedly concur with him.

Dr. Roe mentions a diagnostic mark of this disease, which he believes has not been hitherto described. It consists, in a marked degree, of fulness or even protrusion of the infra-clavicular region on the affected side;

this often exists to a remarkable degree, and it is generally associated with increased resonance of the voice in the same situation. Are we indebted to Dr. F. Bird, or to the author, for this diagnostic mark? the paper leaves us in doubt. He does not regard the bulging of the intercostal muscles as a constant or a frequent sign of the presence of fluid in the chest, and agrees with Dr. Stokes, who is of opinion that it only takes place in cases of purulent secretion. He believes that the protrusion does not depend on mechanical pressure, and is indicative of the quality, not of the quantity, of the effusion, but no attempt is made to explain its cause. Is not the bulging influenced a good deal by the thickness of the false membrane lining the costal pleura? when thin it must yield to pressure and when thick resist it. Dr. Roe very properly cautions the practitioner not to attach too much value to the side on which the patient lies as indicating the seat of effusion, and refers to a case in which death was produced by paracentesis having been performed on the healthy side from this cause. This ought not to happen, for no operation should be performed unless the other signs clearly indicated the seat and nature of the disease. The left side of the chest is more frequently affected than the right, in the proportion, as estimated from the cases in the paper, of seven to five. A table is given shewing the results of the operation in those cases in which it has been employed under the author's observation or that of his friends. Of these 24 cases, 18 recovered and six died. Nine of these were cases of empyema, of which 8 recovered and 1 died. Thirteen were cases of inflammatory hydrothorax, of which 9 recovered and 4 died. One was a case of mechanical hydrothorax and the patient was relieved. One was a case of pneumothorax and fatal. Dr. Roe also gives some notes of the result of this operation, collected by Mr. B. Phillips. Of 122 cases, 88 were cured: 31 were cases of pyothorax, of which 26 were cured, and 9 cases of hydrothorax, of which 6 were cured. The paper is followed by a long appendix containing the particulars of the 24 cases given in the table. Our analysis of this communication has been so full that we must refer those of our readers desirous of further information to the volume itself. It is remarked, in conclusion, that these cases "will show that the success of the operation was directly in proportion to the shortness of the time which intervened between the accumulation of the fluid and the performance of the operation, and that when it was unsuccessful the chief cause of its failure was its being postponed until too late a period."

Our author's experience of paracentesis thoracis, in cases of effusion into the chest appears to have been unusually large, and the results which he has here detailed cannot fail to be useful in determining the doubtful questions of treatment. The propriety of operating in cases of empyema as soon as the presence of pus is detected, is pretty generally admitted; and Dr. Roe's observations show that, even in cases of hydrothorax, delay may be injurious, and lessen the chances of perfect recovery. We think, however, that the valuable information which this paper contains might have been presented to the Society in a less diffuse form. There is a good deal of repetition, and even common place observations which add unnecessarily to the length of the paper.

XIX. Account of a Case of Empyema which recovered after repeated Punctures of the Pleural Sac. By *Theophilus Thompson*, M.D.

The subject of this disease was a boy between five and six years of age, and Dr. Thompson was not consulted till the little patient had been ill two months, and had evident symptoms of considerable effusion in the right side of the chest. Mercurial ointment, quinine, and decoction of chimaphila were tried for a few days, but as the effusion appeared to increase, an exploratory needle was introduced into the side, and pus detected. The operation of paracentesis was at once performed with a trocar, and fourteen ounces of greenish yellow pus were withdrawn. The wound was afterwards closed. The boy was relieved for a time, but in three days it became necessary to repeat the operation, when a pint of matter was discharged. Ten days afterwards twenty more ounces were removed, and again on the 21st of July, at the end of eleven days, a fourth operation was performed, and twenty-two ounces of thick matter were rapidly withdrawn. He improved in strength, and on the 28th the wound re-opened and gave exit to about four ounces of pus. A discharge continued to take place from one or other of the orifices made in the operations for several months. In December, the discharge, which had previously averaged two ounces in twenty-four hours, was reduced to an ounce, and after the application of ung. hydr. nitr. ox. to the opening for a few days, ceased altogether, but returned on the discontinuance of the ointment.

"It was obvious, on the one hand, that any attempt to close the orifice would lead to injurious results, and on the other, that the fistulous opening might remain for life, unless some measure could be adopted to effect the gradual but complete emptying of the sac, and the approximation of its sides. We therefore determined cautiously to dilate the opening, and with this view Mr. Robarts prepared a plug, consisting of a piece of sponge, which had previously been firmly tied round with packthread, and saturated with wax.

"This plug was introduced at night, on the 31st of December, and when removed on the 2nd of January, was followed by a copious discharge of pus. In a few days, the aperture having again contracted, another plug was introduced, and the next day withdrawn, when about six ounces of pus were discharged in a jet.

"As the results of this plan proved so encouraging, the plug was again introduced on the 22nd of January, and removed the next day, when half an ounce of matter, still inoffensive, was removed." 278.

After this period there was no fresh discharge, the orifice permanently healed, and the boy has remained perfectly well.

The author, in his observations on this case, takes the same view of the inutility of remedies and the necessity for a prompt operation in cases of empyema, as that advocated by the writer of the preceding paper,—a view which is sanctioned by our best practical physicians. He adopted also the same practice as that pursued by Dr. Roe, of repeating the operation in preference to leaving a canula in the wound.

We are at a loss. indeed, to find sufficient novelty in the case to account for a place being allotted to the paper in these Transactions. The chief point of interest, was the successful attempt to promote the gradual con-

traction of the suppurating cavity by dilating the fistulous opening, so as to permit a free discharge of the pus, the credit of which practice the author justly gives to Mr. Robarts, who originally requested Dr. Thompson's assistance in the case.

XX. Observations on the Omental Sacs which are sometimes found in Strangulated Herniæ, completely enveloping the Intestine; with Cases and Dissections: to which has been added, a Table of all the Strangulated Herniæ operated on at St. George's Hospital, in 1843–44. By *Prescott Hewett*, Esq.

The author remarks that in an operation for strangulated hernia, the intestine is not unfrequently found surrounded by omentum, which appears to form a second sac; but, with a little care it may be unfolded, and the intestine thus easily laid bare. But cases in which the intestine is contained in a *complete sac*, formed by the omentum, which it is *absolutely necessary to divide*, to reach the gut, have been rarely met with. After alluding to the imperfect notices of this subject to be met with in authors, he mentions that complete omental sacs were found in four cases out of thirty-four operations for strangulated hernia, performed at St. George's Hospital, in 1842-43; of these four cases, two were femoral, one inguinal, and one umbilical:—

"The formation of these sacs is attributed, by Richter, to the firm agglutination of the margins of the omentum, which has surrounded the bowel. To this explanation of Richter's, which does not appear to be applicable to the majority of cases, the two following explanations of the manner in which these sacs are, in some cases, formed, have been added.

"1st. The gut, *completely enveloped* by the omentum, passes through the ring, and the omentum thus disposed round the intestine, becomes attached to the circumference of the neck of the hernial sac; this omental pouch is subsequently distended by the intestine, and thus forms a complete lining to the hernial sac.

"2nd. An epiplocele takes place, and the portion of omentum which is protruded becomes altered in structure, and its folds firmly united to each other by the effusion of lymph; but within the abdominal cavity, in the neighborhood of the ring, the folds into which the omentum has been drawn may not be agglutinated; they will thus leave spaces into which a knuckle of intestine may insinuate itself, pass through the ring, and form for itself a bed in the altered mass of omentum which is in the hernial sac. It may happen, that two or three portions of gut may slip into the different spaces left between the folds of the omentum, and subsequently form for themselves separate pouches. Several separate sacs, with narrow necks, may be thus found in the omental mass which is in the hernial sac." 285.

Once formed, these sacs may attain an immense size. In one case, the sac measured six inches in length, and eleven inches in circumference, at its broadest part.

"The omentum in which a sac has been formed may, in the course of time, especially if it is irreducible, become altered in structure, either by the effusion of lymph, or by a deposition of fat which takes place in the walls of the sac.

"By this alteration of structure the thickened sac may, in an operation, be-

come the source of very great difficulties. In Case 4, it will be seen that so great was the accumulation of fat in the layers of the omentum forming the sac, that its walls were, in some places, more than an inch thick. In this case the deposition of fat had principally taken place towards the lower part of the sac; at its neck the omentum was but slightly altered in structure. The incision made at the time of the operation corresponded to this part of the omentum, so that, when the hernial sac was laid open, the gut appeared to be covered merely by a band of omentum, which was easily divided, and the gut reduced; after which, the sac was ascertained to be, with the exception of this slightly thickened band of omentum, quite empty; but no satisfactory explanation could be given of the nature of the thickened mass which still remained in the scrotum. A careful dissection, made at the *post-mortem* examination, proved that this mass consisted of the thickened omental sac above referred to." 286.

These omental sacs may either lie loose in the cavity of the hernial sac, or the two sacs may have contracted more or less extensive and firm adhesions with each other. In one case, the omental sac was quite free from adhesions; in another, the two sacs adhered firmly to each other at the neck, in the whole of their circumference; and in Case 4, the two sacs were firmly united to each other, throughout their whole extent, by a firm, close, cellular tissue.

The author remarks that these cases "naturally give rise to a question of great practical importance, as to what course ought to be pursued where the hernial sac appears to contain thickened omentum only. In such cases the omentum ought to be drawn out and carefully examined, to see that it does not form a sac containing a portion of intestine. If the omentum is thickened, and firmly united to the neck of the hernial sac, throughout its whole circumference, a longitudinal incision should be carefully made in the whole length of the thickened omentum, to ascertain that it does not form one of these omental sacs. The enormous thickness which the walls of an omental sac may present, must here be borne in mind. The precaution of introducing the finger to ascertain that the neck of the sac is free, is, in these cases, particularly necessary."

The intestine contained in an omental sac may be united to its internal surface. In one case the intestine was firmly united to the neck; in the three other cases, the intestine was free from adhesions. The neck of the omental sac may become the sole cause of strangulation; of this Mr. Hewett mentions a well-marked example, in which Mr. Hawkins was obliged, after having freely divided the neck of the hernial sac and the ring, to divide the neck of the omental sac before the gut could be reduced. Had the practice of reducing the hernia without opening the hernial sac been followed in this case, the gut, still strangulated by the omental sac, might have been reduced, and a fatal termination been the consequence. Such cases as these, the author considers, are a strong argument against the practice of reducing a hernia without opening the hernial sac. Upon this point we beg to differ from him. The argument applies with equal force as an objection to the employment of the taxis, but the complication is, as Mr. Hewett admits, very rare, and we think that no surgeon should be deterred by the liability to it, from resorting to the taxis, or dividing the stricture external to the sac. We believe, indeed, that the reduction "en masse" is more likely to occur from the taxis before the operation than when the integuments of the sac are divided, and

the parts are more fully under the observation of the surgeon. The division of the omental sac, it is remarked, may be followed by hæmorrhage, the vessels being sometimes enlarged. There can be no difficulty in securing them if necessary. In conclusion, the author points out the importance of *carefully* examining every portion of omentum which is in a hernial sac, so as to ascertain that no knuckle of intestine is contained within its folds, before it is returned into the abdomen, left in the sac, or removed altogether. The four cases are well described, but we have not space for the particulars.

The table of strangulated herniæ includes 34 cases. Of these, 25 were cured, and 9 died. In all, the sac was opened; in some, an attempt was made to reduce the hernia without opening the sac, but unsuccessfully.

We believe that most surgeons who have had experience in operations for hernia are acquainted with the complication described in this paper, but as the subject has been imperfectly noticed by writers, Mr. Hewett's observations will be read with much interest.

XXI. Account of a Case of a Dissecting Aneurism of the Aorta, Innominata, and Right Carotid Arteries, giving rise to Suppression of Urine and White Softening of the Brain. By *Robert Bentley Todd*, M.D., F.R.S.

The subject of this disease was Mr. T——, æt. 37, a stout muscular plethoric, man, who was suddenly seized on the 16th of February, whilst sitting at dinner, with a fainting fit. He quickly recovered, but complained of violent abdominal pain and nausea, with pain in the back. Vomiting ensued. Next day he complained of violent pain in the loins, extending to the groins and testicles, which was relieved by cupping. Great drowsiness; urine scanty and high-coloured. On the 19th, *no urine had passed for forty-eight hours.* Dr. Todd found him lying on his back, with all the aspect of a man labouring under an oppressed brain. When aroused he answered questions rationally, but immediately relapsed into his previous drowsy state. There was evident paralysis of the left side of the face, and also imperfect paralysis of the left upper and lower extremities. The pulse was full, but compressible; but there was a marked difference on the two sides. *On the right it was small and feeble.* On examining the heart, the first sound was accompanied by a bellows-sound, distinctly audible in the direction of the arteria innominata. It had a peculiar rumbling character, as if the blood had to encounter a considerable obstacle. On enquiry, he stated that he had always enjoyed good health, but that he could not breathe as freely on the left side as on the right. The treatment consisted chiefly of cupping and blisters to the back of the neck, purging and afterwards diuretics, the hot air-bath, and subsequently stimulants. On the 26th, the action of the kidneys was restored, and the paralysis slightly diminished; but the patient evinced an alarming tendency to sink. On the next day, whilst raised in bed, having just finished drinking, he was seized with a slight convulsion, and fell back dead. The body was examined on the 29th. Surface exsanguineous. Very little blood in the divided vessels of the scalp. The right side

the brain decidedly paler than the left. When the hemisphere was cut into, there was a total absence of bloody spots, which however, existed in their ordinary number in the left hemisphere, which was perfectly natural.

"On examining the cut surface of the centrum ovale on the right side, it presented the appearance as if it had been worm-eaten in patches. Each patch was from half an inch to an inch in diameter. It had the same colour as the surrounding brain substance, but was evidently diminished in consistence: the slightest lateral friction with the edge of the knife completely disarranged it; and when a stream of water was poured upon it, it was broken up into shreds which floated in the water. These patches were very numerous; they were found in all that part of the hemisphere which is above the fissure of Sylvius; each was surrounded by cerebral substance of nearly natural consistence. Many of the patches were superficial, and involved portions of the grey matter of the convolutions, which exhibited the same degree of softening. They were all perfectly free from admixture with any foreign material, such as pus, or with blood. I searched for the former by the aid of the microscrope, but could find no trace of it. Nerve-tubes were seen in their ordinary number, which seemed easily broken up and very varicose.

"The right half of the fornix, and the septum lucidum, were likewise extremely soft.

"The paleness of the grey matter of the convolutions on the right side particularly attracted notice. No appearance of red blood was visible to the naked eye. On the left side, the colour was perhaps a little paler than is natural.

"The bloodless state of the right side was strikingly evinced by the extreme paleness of the choroid plexus on that side, while that of the left side retained nearly is natural colour." 315.

The author remarks:—

"These appearances at once explained the paralysis of the left side, under which our patient laboured. It was plain, from the peculiar exsanguineousness of the whole hemisphere, that it must have been deprived of a large proportion of its usual supply of blood; and that that portion of it suffered most which derived its nutriment from the middle cerebral artery in the fissure of Sylvius. In fact, this side of the brain was thrown upon the branches of the vertebral artery and the anastomosing branches from the opposite side for its supply of blood. The improvement which took place in the paralytic symptoms during the last two days of our patient's life, denoted that the collateral circulation had begun to convey a larger amount of blood to the right side of the brain; and no doubt, had he lived longer, it would have been quite sufficient to restore the nutrition of that organ." 316.

No explanation of the exsanguineous state of one-half of the brain could be derived from an examination of its arteries: they were pale and empty, but free from disease. The chest was opened, and the pericardium found distended with blood; a layer of dark and recent coagulum, nearly an inch in thickness, surrounding the heart, which was larger and firmer than natural.

"The source of the hæmorrhage was found to be the aorta, which had given way, and allowed the blood to escape through a small fissure of its external coat, and of the portion of the pericardium which is reflected on it. This was situate about an inch beyond the ostium aortæ, and was large enough to admit a small goose-quill,

"The arch of the aorta at this part was evidently much dilated. All the coats, however, did not participate in the distention, for it was soon evident, on ex-

amination, that the outer or cellular coat was separated from the middle coat, for some extent, leaving a considerable space in which the blood accumulated.

"The aorta was laid open along its concave border. The semi-lunar valves were healthy. Several atheromatous patches were found in the valve of Lieutaud, in the arch, and in greater number in the descending aorta. In one of these patches, about half an inch beyond the free margin of the semi-lunar valves, ulceration had taken place. This ulcer was the starting point of a transverse rent, which involved the inner and middle coats of the artery, and through which the blood found its way into the sac, between the outer and middle coats.

"The separation of the coats, however, was not limited to the first portion of the aorta. It proceeded along the posterior surface and convex edge of the arch, involving the innominata artery, and, to a partial extent, the left carotid and subclavian. The middle coat of the aorta was split into two layers, between which the blood formed for itself a new channel, down to the abdominal aorta, in which it was evident, from the presence of recent coagula in it, that blood had recently flowed.

"A new channel was likewise formed by the splitting of the middle coat of the innominata on its outer and posterior part. This channel extended up to the lower part of the common carotid artery, and the blood accumulated there to such an extent as to obliterate the canal of the artery completely, and effectually to stop the ascent of the blood into it. Two channels were thus found in the innominata; one leading to the carotid, which was formed by the splitting of the middle coat; the other, the natural one, much diminished in size, through which the subclavian was supplied." 318.

All the tunics of the arteries involved in the laceration wore a healthy aspect, and without doubt the laceration was quite recent. By an oversight the abdominal aorta was not examined, but Dr. Todd thinks it highly probable, from the suppression of urine taking place so early after the seizure, that the new channel must have extended so low as to impede, for a time, the current of blood in the renal arteries. The kidneys were large and in the second stage of granular disease. Dr. Todd makes the following remarks upon the connection between the morbid appearances and symptoms experienced during life:—

"It cannot be doubted that the laceration of the aorta and the formation of the new channel throughout its course was the cause of the fainting fit which ushered in his illness. The sudden diversion from the brain, of so large a portion of blood as that which one carotid artery is accustomed to supply to it, whilst the patient was in an erect posture, was alone a sufficient cause for syncope. And to this may be added the disturbance which the heart must have experienced from the sudden opening of the new channel. The severe pain in the back is explained by the forcible tearing up of the aortic walls, by means of the column of blood forced along it. Those who attend to the sensations which are produced in their own persons under the influence of particular changes, must have remarked the painful feeling which is perceived along the course of the abdominal aorta, when the heart's action is forcibly excited by a sudden emotion of the mind. How much greater must be the pain which is excited by the *laceration*, than that which results simply from the distension of the artery!

"The encroachment upon the calibre of the innominata by the formation of the new channel in it, accounted for the peculiarity of the pulse in the right wrist, which attracted our attention from the first. And the plugging of the carotid low in the neck, explained the laboured pulsation which was felt just below the obstacle.

"Not the least interesting point in the case is the obvious connection which existed between the softening of the brain and the stoppage of the circulation in the common carotid artery. We have seen that the patches of white softening were limited to that part of the brain which is supplied by the middle cerebral artery. This artery is the principal branch of the carotid within the cranium, and has a less free communication with the corresponding ramifications of the opposite side than any of the other arteries of the brain. Hence the parts supplied by it are more apt to suffer than those which are nourished by the other branches of the carotid.

"How strikingly illustrative, too, is this case, of the nature of that morbid change which is known by the name of *white softening*, or more properly, *softening without discolouration*. There was not a particle of evidence derivable from the anatomical condition of the parts to prove the existence of inflammation. The softening depended upon the cessation of the circulation in the carotid as evidently as do cases of senile gangrene upon obstructed arteries in the affected limb.

"The internal carotid arteries of opposite sides do not anastomose with each other by any means so freely as do the external. This was illustrated by the fact that the circulation was very quickly restored in the branches of the external carotid, for the pulsations of the right temporal artery were all along distinct, and there was no appearance of any want of nutrition in the right side of the face.

"When the circulation is obstructed in the *internal* carotid artery, the chief source of supply to the brain on the same side is from the vertebral artery. That this collateral circulation is amply sufficient to prevent any injurious influence upon the functions of the brain, is abundantly proved by many recorded cases of spontaneous or artificial obstruction of the common carotid artery.* How is it that it was insufficient in this case? This question may be satisfactorily answered by referring to the narrowed dimensions of the innominata and right subclavian arteries, and the consequent imperfect supply of the right vertebral. In the cases above alluded to, in which no cerebral symptoms followed obstruction of the carotid, the course of the vertebral was free and unimpeded." 323.

As additional evidence of the gradual way in which the seeds of serious organic disease are sown without attracting attention, it is stated that he was twice passed as a healthy assurable life within a recent period.

We regret that we have been obliged considerably to abridge the particulars of this very interesting case.

XXII. Case of Aneurism of the External Iliac, in which a Ligature was applied to the Common Iliac Artery. By *Richard Hey*, Esq.

The author first gives a brief account of the nine cases in which a ligature has been applied to the common iliac artery. Of these, six were unsuccessful, and three successful. The present case makes a fourth in which the patient recovered. When Mr. Hey visited his patient, the tumor had rapidly increased in the course of ten or twelve days from a very small size, accompanied with great pain in the course of the anterior

* "See the chapter on Carotid Aneurism in Mr. Hodgson's book on the Diseases of Arteries."

crural nerve. As the skin soon threatened to give way, the operation of tying the common iliac was determined on.

"The tumor now occupied the whole of the left iliac fossa, extending from below Poupart's ligament to within little more than an inch from the umbilicus; the vertical diameter was six inches, the transverse six inches and a half; the swelling also projected at least three inches from the plane of the abdomen. It presented all the usual characters of aneurism. The patient was placed on a mattrass, inclining somewhat to his left side, and his shoulders moderately raised.

"I commenced the operation by an incision which reached from about two inches and three quarters above the umbilicus to the base of the tumor, being about six inches in length, and moderately curved; this was afterwards extended by an angular continuation an inch and a half in length; it was also exactly three inches to the left of the median line. The fibres of the external and internal oblique and transversalis muscles were successively divided; and the transversalis fascia having been readily raised with a director, was carefully opened, to an extent equal with that of the external incision. The peritoneum now protruded, but being greatly depressed and drawn towards the opposite side, I was enabled slowly to insinuate my fingers behind it, so as to separate it from its cellular attachment to the adjacent parts. The common iliac artery was easily reached, and its compression with the finger instantly stopped the pulsation in the tumor. A little time was occupied in scratching through the sheath of the artery; a common silver aneurism needle was now passed under the artery, armed with a double ligature of staymakers' silk, waxed. By holding aside the peritoneum and viscera, a momentary view of the artery was now obtained, and its complete isolation ascertained. The ligature was then tightened with the fingers close down upon the artery, when the pulsation entirely and finally ceased. The situation of the ligature was I believe an inch below the bifurcation of the aorta, or very little more." 329.

The time occupied in the operation was 25 minutes. The patient was much exhausted, notwithstanding the little blood lost. The wound healed favourably and the ligature came away on the 28th day. The author notices a source of anxiety in the after-treatment, viz. distension and violent spasm of the bowels accompanied with obstinate costiveness. This was found to proceed from the bowel being distended with an enormous mass of dry and hard fæces, the pressure of the aneurismal sac on the colon having prevented the contents of that viscus from descending into the rectum. The mass was with difficulty broken down and the patient relieved.

We sincerely congratulate the author on the result of his surgical skill in this case. It must undoubtedly tend to maintain the fame which has so long attached to the name of Hey.

XXIII. Two Cases of Tubular Expectoration from the Bronchi, in the Adult. By *James Reid*, M.D.

The author, after noticing the rarity of this disease and that few cases of it are placed on record, describes two cases. In one, a married woman, æt. 28, after an attack of bronchitis followed by a chronic cough, expectorated several arborescent membranous substances, resembling casts of the minute bronchial tubes, for three days, the quantity gradually dimin

ishing. She suffered from a recurrence of the attacks five or six times, at intervals varying from one to three weeks in extent, but each attack being preceded by a sense of suffocation. The patient lost flesh and strength, but recovered her health on removing to Devonshire in the summer. On her return to town in the winter she had a return of the complaint, which was again relieved by the expectoration of the arborescent tubular substance. There was no further relapse, and the patient died the succeeding winter of a disease unconnected with the chest. The second case was that of a barrister, æt. 44, who, after several attacks of cough, expectorated several portions of tubular substance, resembling plastic casts of the extreme bronchial tubes, accompanied with hæmorrhage. The expectoration of this solid matter and blood recurred at intervals, but subsequently ceased, and at the end of nearly two years there had been no return of the disease. It is a curious coincidence, that the brother of this patient was afterwards affected with the same complaint. The case is related by Dr. Watson in his published Lectures. The bronchial concretions seemed with few exceptions, to be hollow, and to contain both air and blood. In the first case there was great dyspnœa, but in the second the cough was never accompanied by a feeling of suffocation. The author we think, rightly attributes the bleeding to the partial detachment of the plastic substance from the turgid mucous membrane. He considers the disease to be chronic inflammation of the mucous membrane of the bronchial tubes of a specific kind, and that the exudation does not depend on the intensity of the inflammation, but on some peculiar action of the parts producing it. It may attack both lungs, or be confined to one, as in the author's second case. He thinks the prognosis favourable, provided the malady is not complicated with phthisis or other serious disease. The higher the plastic formation takes place in the air-tubes, the more severe will be the symptoms. Dr. Reid does not recommend active treatment, but is disposed to rely more on the employment of ipecacuanha, squills, and other mild expectorants, conjoined with light diet.

XXIV. A Tabular View of the Seat of Tubercule in one hundred and eighty Cases of Tubercle of the Lungs in Children, with Remarks on Pulmonary Phthisis in the Young Subject. By *P. Hennis Green*, M.B.

In this paper the author proposes to indicate a few of the peculiarities which distinguish infantile consumption from the phthisis of adults. He gives a table of 180 cases of thoracic tubercle for the purpose of furnishing data for the history of pulmonary consumption in children. He remarks, "the main character which distinguishes the phthisis of children from that of adults is this,—in children, the tubercular deposit occupies a much larger surface of the lung, is more rapidly secreted, and is complicated with tubercular disease of other organs more frequently than in the adult. Hence children often sink under phthisis before the complaint has arrived at its third stage; while on the other hand, the modifications produced by an extensive diffusion of tubercular matter often render the diagnosis of the disease obscure and difficult. In addition to this character

we have the peculiarities occasionally induced by excessive tuberculization of the bronchial glands, giving rise to bronchial phthisis, a form of disease altogether confined to the child."

The author notices an important modification which should guide the practitioner when he seeks to determine the existence of cavern in young children, viz., that under five years of age, the cavernous excavation is generally seated in the lower or middle lobes, and is almost always confined to one side of the chest. To show that the general diffusion of tubercular matter forms a striking characteristic of phthisis in children, Dr. Green compares some of M. Louis' results with those deducible from his table.

"In 358 cases of phthisis in adults, M. Louis mentions the existence of tubercular matter in the brain or its membranes only once. In the bronchial glands, tubercles were found in about one-fifth of the cases; in the mesenteric glands, in one-fifth; in the liver, only twice; in the kidneys, five times in 170 cases; on the other hand, ulceration of the larynx existed in one-fourth,—ulceration of the bowels in five-sixths of the cases.

"The history of phthisis in children presents us with very different results. The brain was affected in one-ninth of the cases; the bronchial glands, in 100 out of 112: the mesenteric glands, in one-half; the liver, in one-ninth; the kidneys, in one-eighteenth; but ulceration of the larynx occurred only once; ulceration of the bowels, sixteen times in the 112 cases." 356.

The physical signs are rarely as well marked as in the adult, and the young child frequently dies before the practitioner is able to decide whether the lung be actually the seat of cavern or not. The cause of this is that, in children, "the tubercular matter is widely diffused, and has implicated many important viscera; in the brain, it may excite hydrocephalus or meningitis; under the serous membrane of the chest, pleurisy; in the abdomen, peritonitis; in the intestines, tubercular ulceration. These complications rapidly undermine the resisting power of the little patient; diarrhœa sets in, and death ensues long before the period at which a fatal termination takes place in the adult."

Infants and children under five years of age hardly ever expectorate. They swallow every thing that comes up into the mouth from the lungs. Hæmoptysis is an exceedingly rare symptom. The symptoms which constitute hectic fever in adults are seldom present together in any marked degree.

The bronchial glands were more or less affected in one hundred out of one hundred and twelve cases. In a few of these cases only were the glands sufficiently enlarged to produce symptoms through their mechanical effects, or by communication with caverns in the lungs and the bronchi, and in such cases the term bronchial phthisis should be confined. Understood thus, this form of phthisis is peculiar to children, and attended with very characteristic symptoms; but it is not, as some writers assert, of frequent occurrence.

"The enlarged bronchial glands may act mechanically on the neighbouring organs contained in the chest, or they may perforate them. Hence a variety of symptoms, depending on the position or function of the injured part.

"The aorta and pulmonary artery, the vena cava, or the pulmonary veins, may be compressed by the tuberculated glands, and the flow of blood more or less impeded. M. Tonellé has related a case in which the superior cava was com-

pletely obstructed, and I have seen one where the pulmonary artery was perfectly flattened between two enormous glands. From the compression of vessels may arise pulmonary apoplexy, fatal hæmorrhage, effusions of serum, or symptoms closely resembling those of organic disease of the heart. The trachea, bronchial tubes, and lungs, may be compressed, and in such cases the symptoms will vary considerably, according to the seat and extent of the mechanical lesion. When the ganglions act on the lower portion of the trachea, MM. Rilliet and Barthez have noticed the existence of a loud, sonorous ronchus, which persists for a considerable length of time. In other cases, the pressure on the large bronchial tubes causes more or less feebleness of the respiratory murmur, which is remarkable in being intermittent.

"Pressure on the eighth pair of nerves or its branches is often attended by very peculiar modifications of the voice and cough. The former is hoarse or occasionally subdued, and even lost; or the hoarseness and loss of voice may alternate. The cough, also, is frequently hoarse, or occurs in fits which bear a close resemblance to those of hooping-cough, but are not followed by vomiting; or the fits may simulate accesses of asthma, with great oppression of breathing, anxiety, agitation, congestion of the head, and cold, viscid sweats.

"The enlarged or softened glands give rise to another order of symptoms, by perforation of the neighbouring parts. Thus fatal hæmorrhage may arise from perforation of the pulmonary artery; pneumo-thorax from perforation of the lung; difficulty of deglutition and accesses of cough on swallowing from perforation of the œsophagus; but we should observe that these symptoms may equally depend on the presence of tubercular matter or of a cavern *in the* lungs." 365.

On the subject of diagnosis of this form of phthisis, the anthor remarks:

"Whenever a child presents several of the rational symptoms of consumption, without our being able to detect any physical signs of the presence of tubercles in the lungs or abdomen, we have good reason to suspect that the bronchial glands are tuberculated. As long as the case continues to present this simple aspect we cannot go beyond suspicion: but it rarely happens that the glands acquire a considerable degree of development, without acting on the surrounding parts or tissues. As these become successively involved, we have a series of varying symptoms, which could not arise from any other source. The eyelids become œdematous, and in proportion to the degree of pressure on the vena cava, the œdema extends to the whole of the face, which is sometimes pale, sometimes tinged with venous injection. This œdema will appear and disappear several times during the course of the disease. The cough suddenly changes its character, and occurs in fits, like those of hooping cough; the voice gets hoarse, and for days may be altogether lost; fits of asthma or of suffocation, as if the heart were diseased, occur. On examining the chest, we heard a loud sonorous ronchus, which persists for a length of time, and then disappears, or is replaced by other *râles* of an anomolous character. When these symptoms are superadded to the rational signs of phthisis, we can have little hesitation in deciding that they arise from tubercular enlargement of the bronchial glands." 366.

We find nothing new on the subject of treatment. Dr. Green objects to emetics, lest irritation of the abdominal viscera hasten the deposit of tubercle in the abdomen, to which the patients are already too prone.

We much regret that we have been compelled to give so condensed an analysis of this excellent paper. Much, very much as Louis has done, it is evident that he has not exhausted the subject of phthisis, and the accurate information presented to us by Dr. Green will be received as a valuable addition to our history of the disease at the period of infancy.

XXV. Case of Tumor in the Right Hypochondrium, occurring after Injury, from which a large quantity of Fluid resembling Bile was repeatedly withdrawn by the operation of Tapping. By *William Robert Barlow*, Esq.

On the 28th of August, a strong healthy man, aged 54, a thatcher, injured himself by lifting a heavy ladder. He complained of so much pain in the region of the liver, that the author apprehended a rupture of that organ. He was faint, in a cold perspiration, and the pulse was scarcely to be felt. He recovered sufficiently to be removed home. By depletion, calomel and opium, &c., the pain was relieved, but his motions presented no appearance of bile. Sept. 15, a swelling, the size of a walnut, was observed over the region of the liver. This gradually increased; he suffered great pain from distention; and from the swelling being limited to the right hypochondrium, and no bile having yet passed by the bowels Mr. Barlow felt confirmed in the opinion, that a rupture of the liver, involving the biliary ducts, had occurred. Oct. 9th. He tapped the swelling and drew off seven quarts of fluid, which from the colour and taste, appeared to be pure bile. The patient was relieved, but the fluid re-collected, and on the 21st, six quarts more of fluid were removed. This on analysis was found to be a serous fluid mixed with bile. He was again tapped, and the whole six times, the last occasion being on the 26th of November. On the following day, after a dose of castor-oil, some bile was observed in the motions. The swelling subsided, the stools became natural, and by the commencement of the February following he had completely regained his health. The editor has appended to this very interesting case the particulars of another bearing a close resemblance to it, related by Dr. William Thompson of Edinburgh.

XXVI. Peculiar Case of Gelatiniform Cancer, in which nearly all the Organs of the Body contained Colloid Tumors; with the appearances on Dissection. By *John C. Warren*, M.D.

The author states that colloid cancer is described by authors as occurring in one single mass, usually of considerable size, but in the case here described, the disease was diffused through nearly all the textures of the body, without presenting any one considerable mass. The case is also remarkable in exhibiting a union of the three admitted forms of malignant disease, scirrhoma, cephaloma, and gelatinoma. The patient was a young man, aged 25, but as the chief interest of this case is connected with the pathological appearances, it will be sufficient to mention, that on examination of the body—its surface was studded with sub-cutaneous tumors about the size of a hazel-nut. They were composed of small granulations, constituted by sacs containing a substance which appeared at first view to be wholly gelatinous, but which, on being divided, discharged a small quantity of viscid fluid. The colour was a mixed grey and red; they were slightly transparent. Similar tumours were found in the thyroid gland, diploë of the skull, ribs, muscles, mediastinum, heart, lungs,

mesenteric glands, stomach, kidneys, testes, &c. There were also tumors of scirrhoma in the liver and of cephaloma in some of the lymphatic vessels. Dr. Warren mentions that the tumors soon lost their transparency on immersion in alcohol. This is not the character of colloid cancer, and we are inclined to suspect that the disease consisted of cysts containing an albuminous fluid, which are occasionally developed in connection with carcinoma. The case however is interesting, and thanks are due to the Transatlantic Professor for the communication.

XXVII. CASE OF NECROSIS OF THE LOWER JAW RECOVERED FROM WITHOUT DEFORMITY. By *William Sharp*, F.R.S.

About two-thirds of the entire lower jaw were removed by a slight operation. The case offers, however, no features of particular interest, and is much less remarkable than a case related by Mr. Perry, in the twenty-first volume of the Transactions, in which the whole of the inferior maxilla was taken away.

XXVIII. REMARKS ON THE PATHOLOGY OF MOLLITIES OSSIUM WITH CASES. By *Samuel Solly*, F.R.S.

The attention of the author was called to this rare disease, by two cases, in which he had the opportunity of tracing its progress during life, and examining the morbid appearances after death. After adverting to the opinion of Dr. Cummin, who, in treating of mollities ossium, calls it the rickets of adults, and to that of Mr. Curling, who, in a minute account of this disease,* alluded to by Mr. Solly, has regarded it as an atrophy of bone; he describes the case of a young woman, aged 29, who having enjoyed good health in early life, began to decline at 19, after an attack of scarlet fever. She suffered pains in the back, passed urine with a whitish sediment, and her spine began to yield. She had pain in the head, became maniacal, and was admitted into St. Luke's Hospital. Whilst there she lost the power of standing, and screamed violently, as if in pain. Her head was observed to be enlarged, and her eyes to project, caused no doubt by the thickening of the walls of the orbit. She was discharged incurable, and after some time taken to Hanwell.

"At the time she was received into this asylum she was much emaciated, and enfeebled, with loss of power in her lower extremities; and two or three months before her death, the bones of the extremities were observed to lose their natural direction, and become curved; subsequently, fractures took place from the slightest causes. She suffered excruciating pain during the whole time she was in the asylum, which she referred to her bones; she did not suffer from spasm of the muscles, as many of these cases do, and the urine, during the whole time she was at Hanwell, was clear and natural. Her appetite was good, and all the functions duly performed, with the exception of the catamenia. Large doses of morphia and other sedatives were administered, to procure sleep and relieve pain. Her mental aberration was extremely slight. Her sufferings were terminated by death on the 28th October, 1842." 441.

* Med. Chir. Transactions, Vol. xx.

On examination of the body, the author found, in addition to deformity of the spine and chest, fractures of the left humerus, both clavicles, radius, and both femurs (the left in two places.) All the bones of the extremities could be fractured with the slightest force—by merely pressing them between the finger and thumb, they gave way and cracked like a thin-shelled walnut.

"A longitudinal and transverse section of the long bones showed that the osseous structure of the bone was nearly absorbed, a mere shell being left. The interior was filled with a dark grumous matter, varying in colour from that of dark blood to a reddish light liver colour. I could not detect any pus globules in it under the microscope. The bones of the vertebral column and ribs were similarly affected; cranium very much thickened, and at least half an inch in diameter, so very soft as to be easily cut with a knife, and very vascular; the two tables were confounded, and the diploë obliterated. Thin slices of the cranium, under the miscroscope, showed that a considerable alteration had taken place in its ultimate structure. The laminated structure of the outer and inner tables was extensively absorbed. The Haversian canals enormously dilated, and the osseous corpuscles diminished in quantity." 442.

The second case was also that of a female, thirty-nine years of age and married. She suffered severely from the pains usually considered rheumatic; her frame became greatly distorted, much in the same way as represented in the well-known case of Madame Sapiot, many bones were fractured, and she ultimately died in St. Thomas's Hospital from asphyxia. During life, her urine was found on examination to contain a large quantity of phosphate of lime—between three and four times the quantity of healthy urine. The body was examined, and in addition to the thinning of the bones which the nature of the case would lead us to expect, the right lung was so compressed as to be almost impervious to air. The left kidney contained a large calculus, consisting solely of phosphate of lime.

Sections were made of several of the diseased bones, and the alterations thus exhibited, consisted chiefly of absorption of the osseous tissue, its place being supplied with a red substance contained in cells more or less vascular. The red matter was examined under the miscroscope by Mr. Birkett and Mr. Simon of King's College. The latter gentleman states :—

"My examination was not at all satisfactory as to the ultimate nature of the disease. There was great excess of the natural fatty matter, and disproportion of the medullary cells to the substance of the bone; in parts there was apparently extravasation of blood, which may have arisen from violence. I was unable to discover any new cell formation, at least any mature one; cytoblasts were exceedingly plentiful, so as to suggest the probability that some such formation was in progress, but nothing further, with the exception of some two or three apparently detached young fat cells. Decidedly there was no show of growing cartilage." 455.

Mr. Solly, after alluding to some of the opinions as to the nature of this disease entertained by writers, remarks, "after a careful consideration of all the facts, but especially by comparing the appearances after death, with the symptoms during life of this awful disease, I am led to believe that it is of an inflammatory character; that it commences with a morbid action of the blood-vessels, which gives rise to that severe pain in the limbs, invariably attendant on this disease, but more especially in its com-

mencement, and exhibits itself after death by an arterial redness of the part. The absorbent vessels are at the same time unnaturally excited, and the earthy matter of the bone is absorbed and thrown out by the kidneys in the urine, which excretion is sometimes so abundant, as we have seen in the last case, that it clogs up the calices and pelvis of the kidney, and forms there a solid calculus."

The cases related by Mr. Solly are interesting and well deserving of record, but it will be perceived that he has not succeeded in throwing much light on the nature of mollities ossium. We believe him to be quite wrong in describing it as of an inflammatory character. The altered state of the osseous tissue is essentially different from that which commonly occurs in bone, as the consequence of inflammation. The appearances of extravasation of blood and of injected vessels, most probably arose from the disturbed state of the bones—the fractures and distortions; and the excessive deposition of fatty matter would necessarily be accompanied with increased redness of the part. The whitish sediment generally remarked in the urine of persons affected with this disease, has long been suspected to consist of the phosphate of lime; and the fact is established by the chemical examination of the urine in the second case in this paper. Mr. Solly states "the miscroscopic examination of this matter, showing cell *development* in its various stages, confirms my impression that it is an *adventitious* morbid product, and not simply the fatty matter of the bone altered by the effusion of blood into it."

It is clear from the account given by Mr. Simon, above quoted, that the evidence of cell development did not appear so satisfactory to him as it did to Mr. Solly and Mr. Birkett, and we have not so firm a faith in the revelations of the miscroscope, to induce us to dissent from what has always appeared to us the most satisfactory account yet given of the character of this curious and rare disease, viz., that published by Mr. Curling, who describes it as *an extreme atrophy* of the bones, analogous to that occurring in a less degree in old age, the place of the osseous tissue being supplied by an excess of the natural fatty matter.

XXIX. Case of Fistulous Communication between the Intestinum Ileum and Urinary Bladder, simulating Stone in the Bladder. By *W. C. Worthington.*

The patient was an old woman, aged 65, who, after an obscure abdominal affection, was seized with a disturbance of the urinary organs, attended with intense suffering. The leading symptoms were frequent and painful micturition, and bloody, ropy, and highly offensive urine, which was observed occasionally to deposit fragments of extraneous matter. On examination after death, the bladder was found to contain fæculent matter and portions of undigested food, such as currants, seeds, and other vegetable matter, which had escaped through an ulcerated opening in the fundus of the bladder communicating with the ileum. The author concludes by referring to a similar case observed by Camper.

A Treatise on Poisons. By *Robert Christison*, M.D., F.R.S.E. Fourth Edition. Black, Edinburgh. 1845. Octavo, pp. 986.

Traite de Toxicologie. Par *M. Orfila.* Fourth Edition. Paris, 1843. 2 Tom. 8vo, pp. 1465.

Principles of Forensic Medicine. Part III. Toxicology. By *W. A. Guy*, M.B. Renshaw, 1844. 8vo, pp. 170.

A Toxicological Chart. By *W. Stowe*, M.R.C.S. Tenth Edition. Highley, 1845.

It says much for the progress and stability of Toxicological Science, that while the fourth editions of the two first-named celebrated works contain a large addition of new facts, and many improvements upon former modes of investigation, their authors find it necessary to abandon no important principles heretofore laid down. Readers will here find a record of every, even the most recent, improvement, whether as regards the detection of the poison or the administration of its antidote. But, although the attentive perusal and frequent consultation of M. Orfila's Treatise, rich as it is in its original observations, ingenious processes, and collection of innumerable experiments, is essential to all engaged in the study of this branch of medical science, yet for the practical man we consider Dr. Christison's book a very superior guide, by reason of its greater perspicuity, the more complete view of the entire subject which it embraces, and the constant references to useful cases, sources of farther information, and important trials with which it teems.

In the present article we intend to notice the subject of General Poisoning at some length, availing ourselves especially of Dr. Christison's observations, which are far more complete upon this subject than those of Orfila; and afterwards to allude to some of the more important particular poisons.

Physiological Action of Poisons.

1. *The Mode of Action.*—The belief that poisons produce their effects through the medium of the nervous system, *i. e.*, by *sympathy*, was at one time generally entertained. The discoveries of Magendie upon venous absorption, and the experiments of later enquirers, have demonstrated that, in the great majority of instances, *absorption* becomes the active agent in influencing the remote organs. Indeed Mr. Blake endeavours, in his papers in recent volumes of the Edinburgh Journal, to prove this to be their exclusive mode of action, even in cases in which death seems to occur almost instantaneously. Dr. Christison, while admitting that the explanation of the *modus operandi* of certain of the poisons upon the principle of sympathy is somewhat shaken, is unable, in the present state of the inquiry to concur with Mr. Blake in his opinion that it is never admissible.

"Mr. Blake, who is altogether opposed to the occurrence of nervous trans-

mission in the instance of any poison, has found that ammonia, injected into the jugular vein of a dog, was indicated in its breath in four seconds; and that chloride of barium or nitrate of baryta, introduced into the same vessel, could be detected in the blood of the carotid artery in about sixteen seconds in the horse, in less than seven seconds in the dog, in six seconds in the fowl, and in four seconds in the rabbit. These interesting discoveries will not however absolutely destróy the conclusiveness of all the facts quoted above in support of the existence of a sympathetic action. For example, they do not shake the validity of those observations, in which it appeared that an interval inappreciable, or barely appreciable, elapsed between the application and action of hydrocyanic acid and of conia. Mr. Blake indeed denies the accuracy of these observations, insisting that, in those he made himself with the most potent poisons, he never failed to witness, before the poison began to act, an interval considerably longer than what had been observed by others, and longer also than what he had found sufficient for the blood to complete the round of the circulation; that, for example, the *wourali* poison, injected into the femoral or jugular vein, did not begin to act for twenty seconds, conia and tobacco for fifteen seconds, extract of nux vomica for 12 seconds; and that hydrocyanic acid dropped on the tongue did not act for eleven seconds if the animal was allowed to inhale its vapour, and not for sixteen seconds if direct access to the lungs was prevented by making the animal breathe through a tube in the windpipe. But Mr. Blake cannot thus summarily rid himself of the positive facts which stand in his way. Duly weighed, the balance of testimony is in favour of those whose accuracy *he impugns*. For, in the first place, they had not, like him, a theory to *build up* with their results, but were observing, most of them at least, the simple fact of the celerity of action. Then, their result is an affirmation or positive statement, and his merely a negative one. They may perfectly well have observed what he was not so fortunate as to witness. And lastly, it is not unreasonable to claim for Sir B. Brodie, Dr. Freer, Mr. Macaulay, and Mr. Taylor, all of them practitioners of experience, the faculty of noting time as accurately as Mr. B. himself. As for my own observations, I feel confident they could not have been made more carefully, and that I had at the moment no preconceived views which the results upheld, but, if any thing, rather the reverse. It is impossible therefore to concede, that Mr. Blake's inquiries, merely because they are at variance with prior results, apparently not less precise and exact than his own, put an end to the argument which has been drawn, in favour of the existence of a sympathetic action, from the extreme swiftness of the operation of some poisons. At the same time, on a dispassionate view of the whole investigation, it must be granted to be doubtful, whether this argument can be now appealed to in its present shape with the confidence which is desirable. And on the whole, the velocity of the circulation on the one hand, and the celerity of the action of certain poisons on the other, are both of them so very great, and the comparative observation of the time occupied by the two phenomena respectively becomes in consequence so difficult and precarious, that it seems unsafe to found upon such an inquiry a confident deduction on either side of so important a physiological question as the existence or non-existence of an action of poisons by sympathy."

2. *The Action of Poisons through Absorption.*—However the action of a few poisons through the medium of the nervous system may be disputed, there can be no doubt the majority act by being absorbed into the blood. Various familiarly-known experiments amply prove this. Addison and Morgan have endeavoured to show that the poisons so admitted into the blood do not act by being transmitted with that fluid to the organs affected by them, but by the influence they exert upon the nerves of the blood-

vessels. This opinion has been much opposed, and may now be considered as disproved, the experiments adduced in support of it being either erroneous or fallacious. Thus, numerous observers have proved that poisonous substances absorbed by the veins of the part to which they are applied may be detected in the tissues of distant organs. Mr. Blake has shown that poisons produce their effects more quickly when injected into the aorta than into the venous system; and that their effects are rapid in proportion to the velocity of the circulation of the animal employed for the experiment.

"On the whole, then, it may be considered as well established, that probably all, but certainly some, poisons,—of the kind whose topical action does not consist in causing destruction or inflammation of the textures to which they are applied,—produce their remote effects solely by entering the blood, and through its means impregnating the organs which are acted on at a distance. And further, if this doctrine be admitted as established, it may also be allowed, that many poisons which do cause topically destruction or inflammation, and remotely the usual sympathetic effects of these changes of structure, also possess the power of affecting distant organs through the medium of the blood."

M. Orfila quotes the conclusions of Blake, with great approbation, and enumerates the following circumstances as exerting an influence upon the absorption of poisons:—

"1. Loss of blood favours their absorption. 2. It may be stated as a general rule that the absorption of any substance soluble in a fluid, is much more rapid so dissolved that when applied in the solid state. Thus a solution of the aqueous extract of opium will produce fatal effects a few minutes after its application to the cellular tissue of the thigh, while the same extract applied in a solid state acts much more slowly. 3. It would be a mistake, however, to deny the absorption of some poisons possessed of little solubility. Thus arsenic, which is so slightly soluble in water, is absorbed with rapidity. 4. Poisons, externally applied, are usually most rapidly absorbed in proportion as the part is abundantly supplied with lymphatic and venous absorbents. Nevertheless, the locality in some cases does not seem to exert any effect; thus, whether arsenic be applied to the cellular tissue of the back or of the inner side of the thigh of a dog, death occurs in both cases at the end of from three to six hours. It may even happen that the dog to whose back it has been applied shall die first. The same quantity of corrosive sublimate, on the other hand, which, applied to the thigh of a dog, will kill it in from fifteen to twenty-four hours, will not cause its death until six or seven days, if applied to its back. 5. The absorption of certain poisons may take place, although they are not brought immediately in contact with the animal tissues. Sal ammoniac or arsenic is absorbed when applied to the cellular tissue in linen bags. 6. There are some poisons which are entirely absorbed, and of which no trace can be found upon examining the part to which they have been applied. On the other hand, a great number are only partially absorbed, and large proportions are found upon the part where they have been placed. Thus, if we apply to the cellular tissue 8 parts of the powder of a vegetable poison, after the death of the animal, 5, 6, or 7 of these may remain—the active portion seeming alone to have been absorbed. But, when the essentially poisonous portion of a vegetable powder is applied, the whole is yet not absorbed, because life is promptly destroyed, and absorption ceases with it."

3. *The Discovery of Poisons in the Blood and Tissues* has only been accomplished of late years. Many circumstances prohibited it. Thus, in the case of very active poisons, the small quantity employed defied detection by the ordinary means of analysis. Various poisons are removed

before death by passing off with the urine, &c. Several of the poisons do not seem to remain in the blood, but become deposited in particular organs, as the liver, which have only of late been submitted to examination. Some poisons, again, are rapidly decomposed on entering the blood. Thus, Dr. Christison was unable to discover oxalic acid in the blood of the *vena cava* of a dog killed in 30 seconds by the injection of 8½ grains into the femoral vein.

"The improvements that have been lately made in the methods of analysis for the detection of poisons in a state of complex mixture with organic substances have done away with a great part of the obstacles which prevented a thorough inquiry as to the existence of poisons in the blood and textures of the body. Some important researches of this kind were referred to in the last edition of the present work; and since then many additional facts of equal variety and precision, have been communicated by different observers, but especially by Professor Orfila. Under the head of each poison, an account will be given hereafter of the evidence in support of the discovery of it by chemical analysis in the blood, textures, and excretions. In the present place it is sufficient to state in general terms that the evidence is quite satisfactory in the instances of iodine, sal-ammoniac, oxalic acid, nitre, sulphuret of potassium, arsenic, mercury, copper, antimony, tin, silver, zinc, bismuth, lead, hydrocyanic acid, cyanide of potassium, carbazotic acid, sulphuretted hydrogen, camphor, and alcohol."

4. *The Organs affected by the remote Action of Poisons.*—Poisons do not, as sometimes stated, affect the general system; and although a few, as oxalic acid, arsenic, and mercury, affect a great number of organs of the body at once, others affect some one important organ in particular. The researches of Mr. Blake have thrown new light upon this as well as upon so many other points relating to the action of poisons. Some affect solely or chiefly the *Heart*. Brodie found that the injection of *tobacco* or *upas antiar* into any part of the body totally paralysed the action of this organ, so that galvanism produced no excitement. Campbell observed the same as regards *arsenic*, and Christison as regards *oxalic acid*—although the other voluntary and involuntary muscles still retained their irritability. Mr. Blake has shown the similar action of various other substances when injected into the jugular vein, as salts of magnesia, zinc, copper, lime, strontia, baryta, lead, silver, ammonia and potash, oxalic acid and digitalis. Other poisons affect the *Lungs*, though probably none do so alone. Thus, tartar emetic and corrosive sublimate induce appearances of inflammation. Mr. Blake has shown that several poisonous substances, which when injected into the veins affect the heart, do not produce any effect upon the lungs, such as oxalic acid, and the salts of magnesia, lime, zinc, copper, ammonia, potash, and strychnia. Others, however, as the salts of strontia, baryta, lead, and silver, as well as digitalis, all of which powerfully affect the heart, and, in addition to these, the salts of soda, which have no action at all upon the heart and hydrocyanic acid, tobacco (?), and euphorbium, which influence it feebly, and even dubiously,—produce, when injected into the jugular, obstruction of the capillaries of the pulmonary circulation, and consequently asphyxia." Many poisons operate upon the *Brain*, as the narcotics and most narcotic-acrids, frequently, however, affecting other organs, as the spine and heart, at the same time.

Mr. Blake has shown that the influence exerted upon the brain by the injection of certain substances into the veins, as the salts of soda, are secondary, and dependent upon the obstructed condition of the pulmonic circulation; but, usually, the effect produced upon this organ, as by opium, is direct—the circulation and respiration becoming only secondarily affected by reason of the annihilation of the functions of the nervous system. Some poisons act specifically upon the *Spinal Cord*, as strychnia, conia, and the wourali.

"Conia, the active principle of hemlock, according to my own researches, produces in the lower animals, however introduced, gradually increasing paralysis, without insensibility or delirium, and without the circulation or respiration being for some time affected, till at length death takes place from stoppage of the breathing by palsy of the respiratory muscles; and, after death, the heart continues beating vigorously, the muscles contract when irritated, and arterialization of the blood in the lungs may be kept up long by maintaining artificial respiration. In this instance it would appear, that the first effect is arrestment of the function of the spinal cord; that the paralysis does not depend upon a direct action on the muscles; and that neither the brain, heart, nor lungs can be influenced, except secondarily, through the consequences of general muscular paralysis. Many poisons which act on the brain also act on the spinal cord."

Mr. Blake's experiments seem to show that certain poisons possess the power of impeding or arresting the *general capillary circulation*, acting on this in common with the pulmonic capillaries, or in a few instances affecting it independently. The various organs not essential to life may be acted upon by poisons, and perhaps the spleen and pancreas are the only considerable organs which are not affected by some poison or other.

5. *Causes modifying the Action of Poisons.*—The action of poisons differs according to the operation of several circumstances. Of these the principal are—(1) *Quantity.* For example, oxalic acid, according to its dose, may produce its local effect upon the stomach, or affect the heart, the spine, or the brain. So a small dose of arsenic may give rise to gastritis, a large one may produce speedy death by its action upon the heart. (2) *Aggregation.* The more minutely a poison is divided the more rapidly and certainly it acts. Thus several, which in their solid state produce little effect, produce speedy death given in solution. (3) *Chemical Combination.* This is sometimes only influential by augmenting solubility. Morphia almost inert, because insoluble, becomes active by the acquisition of solubility upon its junction with acids. Two general laws may be stated: one, that *poisons which only act locally, have their action much impaired or even neutralized, in their chemical combinations:* the other, *that the action of poisons which operate by entering the blood, although it may be somewhat lessened, cannot be destroyed or altered in their chemical combinations.* Sulphuric acid and the fixed alkalis are examples of the first of these, and morphia of the second. Mr. Blake has endeavoured to prove that *salts of the same base produce the same actions,* independently of the acids with which they are combined; and he considers it probable that those which *are isomorphous, or possess the same crystalline forms, are closely allied in action.* (4) *Mixture.* This may influence by dilution which generally, although not with a powerful irritant, lessens the action; or by offering a

mechanical impediment to the action of poison on the tissues, as when the substance mixed with it is in fine powder. (5) *Difference of Tissue.* Poisons, with the exception of the corrosive and irritant, manifest a difference in their action according to the tissues they are applied to, acting "least energetically on the skin, more actively on the alimentary mucous membrane, still more so on the serous membranes, and most powerfully of all when introduced directly into a vessel." Their action upon the pulmonary mucous membrane takes place almost as rapidly as when introduced into a vein. Poisons which act upon the sentient extremities of nerves do not act at all upon the cut surface of the brain or nerves, or upon any part of the course of the latter. It is not only as regards the rapidity of action that different tissues influence the effects of poisons. Thus a poison, as of a viper, which injected into a vein proves rapidly fatal, if swallowed in large quantity is harmless.

"Differences in the absorbing power of the tissues cannot explain these facts. The only rational way of accounting for them is by supposing that a part of the poison is decomposed,—the change being greatest where the absorption is slowest, and the power of assimilation strongest, namely in the stomach,—and least where absorption is quickest and assimilation almost wanting, namely in a wound. This explanation derives support from the different effects of change of tissue on poisons of the different kingdoms. Mineral poisons are least, and animal poisons are most, affected in their action by differences of tissue, while vegetable poisons hold the middle place; an arrangement which coincides with the respective difficulty of decomposition among mineral, vegetable, and animal substances generally, whether under physical or under vital processes. These views regarding the decomposition of poisons, were suggested to me in 1823, by my friend, Dr. Coindet, Jun., of Geneva."

(6) *Differences of Organ* are not entirely referable to differences of tissue: but depend much upon the importance of the organ in the general economy. (7) *Habit* and *Idiosyncracy.* The effect of *habit* in lessening the energy of the action of some poisons is familiarly known. The poisons which act upon the brain and nervous system, and induce narcotism, as opium and alcohol, are those chiefly observed to be so influenced. Even with regard to these, habit usually only diminishes their immediate effects, disease or a predisposition to it, being engendered, except seemingly in the case of tobacco, by their long-continued use. Of another class of poisons, Dr. Christison observes :—

"But as to *inorganic poisons* that enter the blood, habit certainly does not diminish, probably rather increases their power. There is no satisfactory evidence, that a person by taking gradually-increasing doses of arsenic may acquire the power of enduring a considerably larger dose than when he began. On the contrary, the stomach rather becomes more tender to the subsequent dose by each repetition. I have little hesitation in avowing my disbelief of the alleged cases of arsenic eaters and corrosive sublimate eaters, who could swallow whole drams at once with impunity. Some have expressed surprise at this statement having been made in former editions of this work, when there is such authority as Byron, Pouqueville, &c., for the hacknied story of Solyman, the sublimate eater of Constantinople, who lived to the age of 100, eating a drachm of the sublimate daily. I must avow, however, that such reporters of a feat so very extraordinary, and where deception was so highly probable, are to me no authority at all.

"In the relative influence of habit on poisons of the three kingdoms of Nature, a new argument will be discovered for the opinion given above, respecting the partial decomposition of organic poisons in some of the tissues. In fact, this partial decomposition accounts very well for the effect of habit. The effect of habit is probably nothing more than an increased power acquired by the stomach of decomposing the poison,—just as it gradually acquires an increased facility in digesting some alimentary substances which are at first very indigestible."

Idiosyncracy generally increases the activity of poisons, and renders numerous articles of diet, &c., poisonous to certain individuals which are usually harmless. The examples of this as regards opium, calomel, shell-fish, mushrooms, &c., &c., are familiar to all. The only instances in which idiosyncracy would seem to decrease the influence of poisonous substances are mercury and alcohol, and in some very rare cases, opium.

(8.) *Diseased states of the Body*, like the effect of habit, often impair the activity of poisons. In various forms of fever there is a diminished susceptibility to the action of mercury, and in others to the action of alcohol. In severe dysentery or epidemic cholera, hæmorrhage, &c., a person may take opium to an extent that would prove fatal in health. Tetanus is remarkable for the insusceptibility to the action of the most potent drugs which it engenders. In mania and delirium tremens immense doses of narcotics may be endured. Hydrophobia always, and hysteria sometimes, impairs the activity of poisons.

"In the operation of this class of modifying agents it is a general law, to which there are probably few exceptions, that they chiefly affect poisons of the organic kingdoms, and the narcotics above all. At least, in the instance of most mineral poisons their influence is very inferior. Their operation may be accounted for in various ways. Sometimes, as in dysentery and cholera, the poison is carried with unusual rapidity through the alimentary canal. Sometimes, again, it remains comparatively inert, because, on account of the impaired activity of absorption, it is not taken up with the usual quickness by the absorbent vessels. And sometimes, as in the instance of tetanus, mania, and rabies, the nervous system is in a state of peculiar excitement, by which the customary action of the poison is in a great measure, if not entirely, counteracted."

General Observations upon the Treatment of Poisoning.

Dr. Christison observes that *antidotes* are of two kinds, the one altering the chemical nature of the poison before it has had time to produce its effects, the other setting up in the system a contrary action to that induced by the poison after its operation has commenced. Antidotes of the latter description, formerly believed to be common, are in fact rare in the extreme; the correction of the remote effects of lead by salivation with mercury, and those of prussic acid by ammonia, being the two chief that can be mentioned. The chemical antidotes may simply operate by neutralizing, and thus destroying, the corrosive effects of a poison, or by destroying the solubility to such an extent as to render its absorption as slight as possible. Many formerly reputed antidotes have been found by modern research not to be possessed of these necessary qualities, both of which, if possible, should exist in the substances employed.

"In recent times a new object in the treatment of poisoning has been pointed out by the discoveries made in its physiology. As it has been proved that many of the most deadly poisons enter the blood, and in all probability act by circulating with that fluid, so it has been inferred that an important object in the treatment is to promote their discharge by the natural secretions. In support of this reasonable inference, it has been lately rendered probable by Orfila, as will be seen under the head of the treatment of the effects of arsenic, that it is of great advantage in some forms of poisoning to increase the discharge of urine."

M. Orfila, speaking of the general treatment of poisoning, says :—

"As I observed in my first edition, we must distinguish *two epochs* in the treatment of poisoning. 1. The poison has not been long swallowed and it yet remains in the digestive canal. We must endeavour to prevent its action by expelling it upwards or downwards, or by combining it with a substance capable of neutralizing its poisonous properties. This object fulfilled, we meet the symptoms which have been produced by the poison by means appropriate to the particular case. 2. The poison has been long swallowed, and vomiting or purging have already occurred, so that the portion of the poison which has not acted has been expelled. It would compromise the safety of the patient, if in this case we endeavoured to decompose the poison, and we must simply oppose the progress of the malady by appropriate general treatment."

Of *counter-poisons or antidotes*, which are to be employed during the *first epoch*, in conjunction with the evacuation of the stomach by emetics or the stomach-pump, M. Orfila observes :—

"A substance is designated an antidote or counter-poison when possessed of the following properties :—1. It may be taken in large quantities without any danger. 2. It must be able to act upon the poison at a temperature equal to, or lower than that of the human body. 3. Its action should be speedy. 4. It must possess the power of decomposing the poison amid the gastric and other secretions the stomach may contain. 5. In acting upon the poison, it should deprive it of all of its deleterious properties. There are medicinal substances which form with *poisons* compounds much less poisonous than these poisons, but which are yet deleterious. These cannot be considered as *perfect antidotes*, but as medicaments which we must employ until others, capable of depriving the poison of all deleterious properties, can be discovered. We may then divide antidotes into two sections :—(1) such as *destroy completely* all deleterious qualities, as the soluble sulphates for the salts of barium and of lead, the soluble chlorides for the salts of silver, &c.: and (2) those which *notably diminish* the fatal effects of poisons, such as albumen for the salts of mercury and copper, gall-nuts for opium, &c."

EVIDENCE OF POISONING.

This, the medico-legal portion of the subject, is treated at some length by both the authors whose works we have so often quoted, and Dr. Guy presents, in his "Principles of Forensic Medicine," a fair summary of Dr. Christison's views. Dr. Guy has been charged with having, in the composition of this concluding part of his work, made an undue use of Mr. Taylor's Manual of Medical Jurisprudence. A charge of plagiarism is a grave affair, and one not very easy to substantiate in a branch of medical science like Toxicology, where original facts added by each suc-

cessive writer cannot be very numerous ; and in the present case it may have been somewhat exaggerated, and some of the proofs adduced in support of it are perhaps far-fetched. Still, we believe that no one can compare the one book with the other without arriving at the conclusion that Dr. Guy has availed himself of Mr. Taylor's labours to an extent that cannot be justified. The recent publication of the Manual, and a somewhat similar error formerly committed with respect to another work of the same author, ought to have impressed a caution which does not seem to have been observed, or have produced the imperfect reparation of a special acknowledgment in the preface to the book. If, almost immediately after the publication of a work, it is allowable to seize hold of it, and submit it to a condensing process, merely because it is the last which has appeared upon the subject, the craft of authorship, or rather of book-making, becomes an easy one indeed. The former parts of Dr. Guy's work contained much useful matter, (though not unvitiated by the same defect,) and some original observations ; and it would have detracted nothing from his reputation had he candidly avowed his obligations to so skilful a toxicologist as Mr. Taylor, although the better course would certainly have been not to have incurred them to this extent.

We must however quit this unpleasing theme : and proceed to enumerate the various sources of Evidence of Poisoning.

1. *Evidence from Symptoms.*—M. Orfila offers several good general observations upon the value which should be attached to symptoms observed during life, and lesions discovered after death; some of which we extract :—

"I have often in the course of this work opposed the opinion of those practitioners who believe they can, by observation of the symptoms and lesions of tissue, not only determine that poisoning has taken place, but the description of poison employed. Nevertheless I am far from asserting that it is useless to make an attentive examination of these symptoms and lesions. On the contrary, I am perfectly convinced that, in most cases, it is indispensable to take them into account, to be enabled to affirm that there has been poisoning, and that, under some circumstances, they may assist us in determining to what class the poison whose nature we may be investigating belongs. *In no case does the existence of a poison in a suspected substance alone suffice for leading to the conclusion that poisoning has occurred* ; and we must necessarily join to this important element of medico-legal research the proofs derived from the symptoms, and frequently from the changes after death. It would be a grave error to suppose that it sufficed to procure a certain quantity of a poisonous substance from matters vomited or passed by stool, or even from the corpse, to be enabled to affirm that poisoning has taken place. The practical chemist, ordinarily charged with this description of analysis, should confine himself to stating that, by this or that process, he has been enabled to procure arsenic, copper, &c. The element in the inquiry which he furnishes is an important one, but it is insufficient; for, in fact, malevolence may have introduced the poison into the substances examined after death. Again, the patient may have employed shortly before death medicinal substances containing arsenic or copper, &c., in large or small doses, and a portion of these may be found either in the digestive canal or the viscera. The poison, too, may exist *naturally* in the body in small proportions, and, if care be not taken to distinguish whether that detected may have existed normally, or have been swallowed, serious error may arise. In fact, nothing is more

easy than determining whether the *lead* or *copper*, the *only dangerous metals whose existence in the human body is indubitable*, which is detected, has been swallowed, or is only such as exists normally in the system."

After alluding to the diseases, such as gastritis, cholera, &c., whose symptoms resemble those occasioned by poisoning, he protests against the unfair use which is often made of the admission of such resemblance.

"It is very wrong for imprudent advocates, whether physicians or not, to seize indiscriminately every occasion which is offered them, for affording support to an accused person by affirming that any evidence drawn from the symptoms manifested by the victims of poisoning, is of no real value. Those who have had the opportunity of observing and examining patients at different epochs after poisoning, hold a different opinion, and do not allow themselves to be led away by loose generalities. * * * * * * They know that the *ensemble* of the symptoms scarcely ever, not to say never, manifest themselves in any other case than poisoning; and that consequently it is completely false to declare that they are *commonly* observed in many spontaneous diseases, as many men unacquainted with our profession, especially M. Raspail, would have us believe of late. We think it requisite to call the attention of practitioners particularly to this point, and to engage them, whenever they are witnesses of these facts, to take great care in preserving the matters vomited, the stools, and the urine of the patient. It is a fact that negligence in this particular *is* extreme. How frequently have we had to deplore the omission of these precautions; for is it not undeniable that the vomits, stools, and urine, would have furnished unequivocal proof of poisoning, in cases where it has been impossible to prove it by an analysis of the remaining contents of the digestive canal and other organs? It is also very important, in order to direct a suitable treatment, to be informed promptly whether poison, and what poison, has given rise to the symptoms. I am aware that there have been some very rare cases, in which persons poisoned, and even by irritant poisons, have manifested no symptoms whatever, and these too have been brought prominently forward by superficial minds, in order to diminish the value which should be attached to the *symptoms* which ordinarily appear. This is an error, for these cases are truly exceptional; and we could scarcely cite four or five well-attested ones in opposition to the innumerable examples of those of a contrary description.

"I cannot terminate this subject without strongly blaming the conduct of those who, summoned before the tribunals for the purpose of appreciating the degree of value to be attached to the symptoms, base their denial of the act of poisoning upon the fact, that the patients *have not manifested all the symptoms* described by authors as characterizing the description of poisoning in question. Will it be believed that, in a case of this kind, in which one of the accused avowed the crime, that one of our *confrères* maintained against me that poisoning by arsenic had not taken place, because the patient had not manifested *some* of the symptoms mentioned in my works. An objection like this possesses no validity, and should not find any favour in the eyes of the Court. Authors who describe *all the symptoms in a general manner*, or which have been observed up to the present time, in those poisoned by the same substance, do not pretend to say that the *ensemble* of these is *necessarily* to be found in every case. In giving a *resumé* of their observations they desire to enumerate all the circumstances which have been already observed, but certainly do not mean to state that all such should be found indiscriminately in every individual case. It may be believed, on the contrary, that in this respect there must be infinite varieties, according to the dose of the poison, the age, constitution, and state of health of the person poisoned, the duration of the effects, and the means employed to combat them, &c."

Dr. Christison, in reference to the doctrine now maintained by all writers on medical jurisprudence, that symptoms, however well-developed, can never justify an opinion beyond high probability, although formerly they were considered as all-sufficient, observes:—

"In laying down this doctrine medical jurists appear to me to have injudiciously confounded together actual symptoms with their general characteristics. If the doctrine is to be held as applying to the evidence from symptoms, only so far as they are viewed in questions of general poisoning—that is, as applying to the general characters merely of the symptoms,—it is deduced from accurate principles. But if it is likewise to be applied, as recent authors have done, to the actual symptoms produced by particular poisons, and in all cases whatever of their action, then it is clearly a rule liable to many important exceptions. These exceptions will be noticed under the heads of mineral acids, oxalic acid, arsenic, corrosive sublimate, nux vomica, &c. At present it is only the general characters of the symptoms, and the points in which they differ from the general characters of the symptoms of natural disease, that I propose to consider."

Of these, the following are enumerated—1. The symptoms are sudden in their appearance and rapid in their progress. 2. Regular in their increase. 3. Uniform in their nature throughout their progress. 4. They commence soon after food, drink, or medicine has been taken. 5. The symptoms appear during a state of perfect health.

These characteristics by no means apply to all poisons or to the same under all circumstances, nor do they always present points of distinction sufficiently marked to render the diagnosis between the symptoms of poisoning, and those occasioned by various diseases, certain. Nevertheless, they are often of great corroborative utility, and their consideration can never be neglected by the medical jurist:—

"For, in the first place, they are of great value as generally giving him the first hints of the cause of mischief, and so leading him to search in time for better evidence. Next, they will often enable him to say that poisoning was possible, probable, or highly probable; which, when the moral evidence is very strong, may be quite enough to decide the case. Thirdly, although they can never entitle him to say that poisoning was certain, they will sometimes enable him to say, on the contrary, that it was impossible. And to conclude, when the chemical or moral evidence proves that poison was given, the characters of the symptoms may be necessary to determine whether it was the cause of death.

"As the last statement is one of consequence, and yet has been overlooked by some authors on medical jurisprudence in this country, it may be illustrated by one or two comments. It does not follow, because a poison has been given, that it is the cause of death; and therefore, in every medico-legal inquiry, the cause of the first symptoms and the cause of death should be made two distinct questions. The question, whether a poison, proved to have been administered, was the cause of death, is to be answered by attending to the second and third characteristics mentioned above, and considering whether the symptoms went on progressively increasing, or altered their nature during the patient's illness, and whether the alteration, if any, was such as may occur in the case of poisoning generally, or of the special poison given."

Dr. Christison illustrates this point by referring to a case in which a girl poisoned by arsenic recovered from its effects, and then died with symptoms of obscure general fever.

2. *Evidence from Morbid Appearances.*—Some of these, to which considerable weight was formerly attached, as lividity of the skin, or early putrefaction of the body, are now not deemed of any importance. Even others, such as an inflamed condition of the alimentary canal, or congestion of the brain, are not invariably present, and are not distinguishable from similar appearances caused by disease. They may afford important corroborative evidence, however, although taken alone they are of no avail. A few poisons, as the mineral acids, produce some characteristic appearances; and, where there is no doubt of poison having been given, the appearances may be of avail in determining whether death has been caused by it. Dr. Christison draws attention to the fact, that the presence of certain appearances of natural disease must not prevent our investigating whether other causes, such as poison, may not have proved the actual cause of death; and mentions instances of extensive disease of a latent character having been found in the bodies of persons who had yet died poisoned.

"The conclusions to be drawn from these facts are that, at all events, the medical inspector, in a question of poisoning, must take care not to be hurried away by the first striking appearances of natural disease which he may observe, and so be induced to conduct the rest of the examination superficially; and likewise, that he should not so frame his opinion on the case, as to exclude the possibility of a different cause from the apparent one, unless the appearances are such as must necessarily have been the cause of death. * * * * * * * * * At present no more need be said, than that the inspector should be particularly on his guard in those cases, in which the appearances, though belonging to the effects of a deadly disease, are trifling; and still more in those in which the appearances, though great, belong to the effects of a disease, whose whole course may be latent. And I may add, that, from what I have observed of medico-legal opinions, the caution now given is strongly called for."

M. Orfila thus sums up the results of his observations upon this branch of the subject:—

"(1) Irritant poisons and a portion of the narcotico-acrids, almost always produce inflammation in one or other portion of the alimentary canal, when taken in a sufficient dose; but this is not the case with the narcotics and the remainder of the narcotico-acrids. (2) It has, however, been completely proved, that, under certain circumstances, some of the irritant poisons have caused death without leaving the slightest trace of alteration in the digestive canal. (3) In a case where, after the early death of an individual suddenly attacked with grave symptoms, the alimentary canal is found inflamed, corroded, ulcerated, &c., we must strongly suspect poisoning, because this *ensemble* of symptoms and lesions is seldom observed in spontaneous disease. (4) Generally speaking, lesions of the lungs, brain, heart, and other organs, are capable of being produced by a too great number of causes, to allow of their being adduced as proofs of poisoning. (5) The physician cannot affirm that poison has occurred until he has indubitably proved the existence of the poisonous substance, either by chemical analysis, or by its physical properties. (6) Where this substance cannot be discovered, and the symptoms and lesions of tissue are analogous to those caused by poisoning, he can only state that the *probabilities* are in favor of this having been the cause of death."

3. *Evidence from Chemical Analysis.*—This is justly deemed the most

satisfactory of all the proofs that can be offered, and the detection of the poison in the stomach or intestines, blood, vomits, or stools, &c., usually supersedes the necessity of any additional assurance. Corroboration, however, by an accurate relation of the symptoms and morbid appearances, is always desirable. It may even be essential in cases in which the poison is supposed to have been introduced into the parts examined subsequently to death, and for the decision of the question whether the poison, proved to have been administered, has been the cause of death or not. However desirable the proof from chemical evidence may be, it is not always to be attained: for several causes may have removed the poison beyond the reach of investigation, death having nevertheless been caused by its instrumentality. Thus, (1) it *may have been discharged by vomiting and purging*. In the body of a man who died eight hours after taking an ounce of arsenic, none could be detected chemically, and in another case, where death resulted in five hours from a solution of arsenic, careful analysis could detect none of the poison. Such cases are the more interesting because it is remarkable for how long a period arsenic will frequently resist the efforts of the stomach to dislodge it entirely, it having been found in that organ after two days of incessant vomiting. Modern improvements in analysis prove that poisons are often retained in the stomach a much longer period than was heretofore suspected. (2) The *poison may have been all absorbed*. This is generally, but not always, the case with laudanum or opium. (3) The *excess of the poison may have become decomposed*. Opium has been in this way digested, and some mineral poisons decomposed in the stomach, still, however, in the last case, remaining amenable to analysis. The changes attendant upon the putrefaction of the body may also give rise to decomposition of the poison. Thus many poisons existing in the stomach at the time of death cannot be detected some time after interment. This is not so much the case with mineral poisons, which have been detected months and years after burial. The researches of Orfila have proved that the prevention of the detection of poisons by their decomposition during the decay of the animal matters around them is much less common than might be expected. (4) Poisons which have been absorbed may be *removed by excretion*.

In reference to this part of our subject M. Orfila presents some interesting remarks upon the following question:—"*Is it necessary, in order to establish the fact of poisoning, to recover a determinate quantity of the poison employed, or is it sufficient to prove that this substance exists in any proportion whatever?* He observes that of late, since his improved procedures have so frequently revealed very small quantities of arsenic, antimony, copper, &c., many practitioners, little accustomed to toxicological research, have accused him of temerity in drawing conclusions from quantities so insignificant. In answer to this opinion, which if admitted, would seriously compromise the interests of society, he states, 1st. *In certain cases of poisoning by mineral substances, susceptible of detection by reagents, the experimenter is unable to detect the smallest atom of the poison.* Suppose, for example, that the stomach has been completely cleared out by vomiting, and the matters vomited have not been preserved. No poison will be detected although poisoning yet has taken place. So, if the re-

search is pursued for the portion that has been absorbed, the success which will attend it depends upon when it is commenced.

"Let several dogs be poisoned by the application of arsenic or tartar-emetic to the cellular tissue of the inner portion of the thigh, and leave some of these animals to their fate. After their death, which will occur in 30 or 40 hours, there will be no difficulty in obtaining notable quantities of arsenic from their viscera. Let others of the poisoned dogs, on the other hand, be submitted to an abundant *diuretic medication*, and if we can cause them to urine abundantly for three or four days they will not die. If we kill them about the ninth or tenth day, not the slightest trace of the poison will be discoverable in their viscera, while their urine during the whole time it has flowed since they were poisoned has afforded appreciable quantities of it. It may then happen that an individual has taken a certain quantity of poison, insufficient to kill him in a few hours, that he manifest symptoms of poisoning during 8, 10, 12, or 15 days, that during this time the poison becomes entirely expelled by vomiting, stool, urine, and perhaps other emunctories, and that at the period when death arrives, whether as a consequence of the poisoning, or of other cause, not a portion of that poison is detected, which, had life been speedily destroyed, must have been infallibly discovered.

"The practitioner will then not conclude that poisoning has not occurred merely because he cannot detect the poisonous substance. He should be the more circumspect in this respect as his want of success, independently of the cause commented upon, may be owing to the imperfection of the procedures he has employed for its detection, or from its being one of those numerous substances which up to the present time elude our investigations. If it is true that we can by delicate analyses detect in the alimentary canal, the stools, or the vomits, notable portions of strychnia, brucia, morphia, prussic acid, &c., it is well known how difficult it is to demonstrate the presence of small portions of these substances when we have to search for them in the blood, or in organs to which they have been carried by process of absorption. We know, too, how powerless is art in the analysis of a number of active vegetable poisons, such as stramonium, henbane, aconite, hemlock, digitalis, &c., and that when the juices or extracts of these plants are mixed in a large proportion with the contents of the alimentary canal. In every case of poisoning, then, when the practitioner is unsuccessful in the detection of the substance employed, he ought before pronouncing an opinion, to examine attentively all the circumstances which have preceded, accompanied, or followed, the disease. Its nature and progress will in certain cases raise suspicions, or establish probabilities, and enable him to furnish an important element in the inquiry. In other cases, he must confine himself to declaring that it is not impossible that the patient has died poisoned, while sometimes he will be enabled to state that death is due to some other cause.

"In the second place, in many cases of poisoning, the practitioner *can only discover in the suspected matters an excessively small proportion of poison.* If there are cases in which none can be discovered, it is easily understood that there are others in which the most skilful chemists can only discover mere traces of its existence. Suppose that death, instead of occurring 10, 12, or 15 days after poisoning, takes place about the fourth or fifth day, it would be a strange error to state that the persons had not been poisoned, because only the few atoms not yet eliminated can be detected. It may be asked also what is the exact quantity necessary for the production of poisoning, and whether we are able to collect the whole of that which may be found in the body after death. All parts of the body cannot be operated upon, and the most skilful must lose a portion of the poison. Then again, the quantity obtained will much depend upon the skill of the operator. If this vague idea of the necessity of procuring a determinate quantity of poison prevails, numbers of guilty persons must escape justice to the great detriment of social order."

We may here express an opinion we have long entertained, that the machinery for the detection of poisoning stands in need of amendment in this country. Whether the investigation be conducted in a satisfactory manner is now a mere matter of chance. It rests with the members of that clumsiest of all medico-legal tribunals, the Coroner's Inquest, to determine whether a post-mortem examination and analysis shall or shall not be performed, and that these have often been neglected in order to save time for the jurors and fees for the county, is well known; but, even supposing an analysis determined upon, what security is there that it shall be effectually performed? The practitioner called in at hazard to attend the deceased may be, and in the majority of instances is, quite competent to the treatment of the case; but he will rarely be the person to whom the management of an analysis upon the effectual performance of which life and death may hinge should be entrusted. Manual dexterity, constant familiarity with the appearances of the various re-agents, and much other special knowledge, are here required, which a man may possibly possess shortly after leaving the schools, but which he cannot retain amid the multifarious and more frequently recurring duties of ordinary practice. This investigation should be consigned to certain special medical officers whose districts should be large enough to ensure a frequent recurrence of similar cases. The teachers of Medical Jurisprudence in our schools would form admirable officers for the investigation of this and other descriptions of sudden death: and indeed they are now voluntarily consulted by those practitioners who wisely decline taking upon themselves the responsibility of deciding upon appearances with which they are insufficiently familiar, and risking the compromising the lives and liberties of their fellow-creatures. Reports from officers of this description might be laid before the coroner's jury, or other more appropriate tribunal, as a foundation for future judicial procedure.

4. *Evidence from Experiments on Animals.*—M. Orfila has a long chapter upon this subject: and the conclusions he arrives at, based upon his extensive experience in this description of research, are interesting and important. He considers the effects which *poisons produce upon dogs to be identical with those observed in the human subject.*

"I can declare that, after having performed many thousand experiments upon dogs, and compared them with what is observed in man, that there is no difference in the nature of the symptoms and the organic lesions which poisons produce; and that the only difference exists in the extent of the dose required, in the influence of the *morale*, and in the relative strength of the animals—circumstances which can only influence the intensity of the symptoms and lesions, and consequently the duration of the disease. I shall support this assertion by a great number of facts, when I come to consider the individual poisons; at present I will refer only to a few of them. The caustic poisons, which especially cause death by producing a violent inflammation in the parts they touch and disorganize, should exert a similar effect upon all the animal tissues. And so experience proves that the concentrated acids and alkalis, the nitrate of silver, the protochloride of Antimony, &c., produce in dogs a similar affection to that which they develop in man. Nux vomica, which powerfully excites the spinal marrow of dogs, acts upon man in the same manner; and indeed the idea of employing this substance in certain cases of paralysis first occurred to M. Fou-

quier, in consequence of Magendie and Delille's experiments upon dogs. It is true these animals are much more easily affected by nux vomica than is man, yet it is undeniable that the latter may die poisoned by it if he takes a sufficient quantity. If we examine attentively the effects which are produced on man and dogs by opium, prussic acid, hellebore, datura, belladonna, deleterious gases, &c., &c., we shall be obliged to allow that all these poisons produce identically the same effects on both species of animal."

But, to obtain exact results from these experiments, M. Orfila believes the *ligature of the œsophagus* indispensable; and he enters into a statement of considerable length to prove that the effects of this operation are not such as to confuse the observation of the results of the experiments. Careful experiments, he says, have assured him "that the conclusions I have drawn need undergo no modification on account of the ligature of the œsophagus; and that it is impossible to write a complete work on poisons without often performing this operation." He separates the œsophagus somewhat from its connexions, and having made a small opening into it, introduces the poison, and then ties a ligature below the aperture;—thus preventing the substance from accidentally entering the air-passages, and rendering its rejection by vomiting impossible. The effects of such ligature, when poison is *not* administered, are:—(1). *It never* produces during the *first two days* more than slight fever and depression, quite incapable of causing death in so brief a period. (2). If the animal is killed at this epoch, no lesion is discoverable. Thus, if an animal, to whom poison has been given, a short time prior to tying the œsophagus, dies within two days after suffering certain severe symptoms, we conclude it has died from the poison. So, too, with respect to the lesions found after death. "The influence which the ligature has exercised upon the animals I have poisoned may now be judged of—a number comprehending at least ⅞ of those I have experimented upon, and which have died at 2, 4, 8, 12, or 24 hours after giving them the poison." (3). The fever and weakness consequent on the operation augment during the 3d, 4th, 5th days, and until death; and various other symptoms, such as vertigo, attempts to vomit, slight convulsions, manifest themselves, though frequently these are absent, and an utter insensibility is alone present. If the poison is one which acts very slowly, its effects and the lesions from the operation might be confounded. In such cases the experiment of producing the same effects without tying the œsophagus must be tried, or, if the œsophagus be tied without forming an opening in it, the animal is hardly inconvenienced for 36 hours. For the study of Poisons under their various relations *this operation is indispensable*. For, whether we investigate the action these substances exert upon the tissues, the symptoms they produce, or the antidotes they require, all is uncertain unless vomiting is rendered impossible; and the experiments of those authors who have not adopted this precaution, in which the animals have in consequence rejected a portion of the substance employed, are of no value whatever.

As to the value which should be attached to evidence derived from the symptoms induced in animals who have been compelled to swallow the contents of the stomach of persons supposed to have died poisoned, M. Orfila observes:—

"(1.) That experiments of this kind should never be tried if, by means of appropriate chemical agents, the observer is already enabled to demonstrate the presence of one or more poisonous substances. (2.) If the chemical inquiry has been fruitless, and there remains a portion of the suspected matter which has not been operated upon, it may be introduced into the stomach of a dog, and the effects observed. (3.) We should never employ for such experiment suspected matters which have already been submitted to the operation of re-agents, with a view to determine upon their poisonous nature—such re-agents being almost always themselves deleterious."

Conclusions can be satisfactorily drawn only when the symptoms following the introduction of the matters containing the suspected poison are acute and death prompt, and lesions corresponding to these are discovered after death. Even where death does result, it may sometimes do so from some disordered condition of the system of the individual having rendered his secretions, and especially the bile, deleterious. On the other hand, the animal not suffering does not prove poison has not been given. It may here become decomposed by the aliments or secretions of the stomach, or removed from among these by rejection in vomiting or absorption. At the best, all such experiments are but secondary and corroborative.

Dr. Christison comes to much the same conclusion of the value of these experiments in the medico-legal point of view.

"On the whole, it appears that, in the present state of our knowledge, experiments or accidental observations on the effects of the contents of the stomach, or of vomited matter, on animals, are equivocal in their import. At the same time it may be observed, as with regard to articles of food, drink, or medicine, that the effects of some poisons on man may be developed so characteristically on animals by the contents of the stomach, as to supply very pointed evidence indeed. Of the force of this statement the following example is a striking illustration. In the case of a girl, who was proved to have died of accidental poisoning by laudanum, the inspector evaporated the contents of the stomach to dryness, made an alcoholic extract from the residue, and giving this to several dogs, chickens, and frogs, found that they were all made lethargic by it, some of them oftener than once, and that a few died comatose. Facts, such as these, agreeing so pointedly with the known effects of the poison suspected, appear to me to yield evidence almost unimpeachable."

5. *Imbibition of Poisons.*—M. Orfila has an interesting chapter upon this subject. As the result of many experiments, he states that solutions of the salts of copper, injected into the stomach and rectum after death, penetrate by imbibition into even distant organs, in the course of several days, when the solution is sufficiently strong. The skin is traversed with great difficulty by such fluids.

"It is very difficult to admit that a corpse, the skin of which continues entire, will allow the easy passage of a poisonous liquid that may accidentally exist in the soil in which it is interred, because this liquid, absorbed in great part by the earth, would be very sparing in quantity, and at most able slightly to moisten it. At any rate, the subcutaneous cellular tissue, and still more the muscles and viscera, can only contain a small proportion of such poisonous fluid at the end of a very long space of time, if ever they contain it at all. It is true, contrary results might be produced if the earth covering the corpse were watered for a long time daily with a poisonous fluid, or if the body could be left in a bath

formed of a poisonous solution; but such a circumstance can never present itself in legal medicine without its being known, and it is therefore absurd to attach the slightest importance to it. In applying these conclusions to poisoning by *arsenic*, I must persist more than ever in an opinion I have delivered, viz., that the soil of a cemetery, even supposing it highly arsenical, which is never the case, will not yield arsenic to a corpse in such a manner as to lead to an opinion that poisoning has occurred. This I do in spite of the assertion of M. Devergie, for independently of what I have said, the arsenical compound found in these soils is completely insoluble, even in boiling water."

From the whole enquiry two conclusions may be drawn—*first*, that all poisons, fluid or solid, providing they are not absolutely insoluble, may be, in cases of poisoning, carried into the various tissues, by imbibition after death, as well as by absorption during life, and which explains why the viscera furnish a larger portion, when examined several days after death than they do when examined during life, or very shortly after death; and *secondly*, that it is possible to procure from the viscera of animals, who have died of some other affection, a certain proportion of a poison which may have been introduced into the alimentary canal *after death*. This latter point is one of scientific interest, only, as M. Orfila states, the annals of crime in no country present an example of any wretch endeavouring to obtain the conviction of an innocent person by such diabolical means. He, however, enumerates the various modes of distinguishing the appearances caused by imbibition after death from those produced by poisoning; but for which we must refer the reader to the work itself.

6. *Moral Evidence.*—The various circumstances which usually constitute this, many of which the medical practitioner is often the person best qualified to take cognizance of, are thus enumerated by Dr. Christison:—(1) The suspicious conduct of the prisoner before the event, such as meddling with, or conversing concerning the properties of poisons. (2) His having in his possession or purchasing, poison upon false or insufficient pretences. Enough stress is not usually laid upon the fact of persons who excuse the possession of poison by their intention of destroying rats with it, not having warned the household of such circumstance. Neglect of this kind gives reasonable ground of great suspicion. (3) The administration of the poison either in food, drink, or medicine. Some recent trials have broken down for want of proof of *administration*. Such proof can rarely be derived but from indirect sources, and the evidence of the medical man is often of great importance, he being generally the first person called, has the opportunity of securing any suspected articles of food for subsequent examination, and thus contributing to the proof of guilt or innocence. A case of poisoning is mentioned in which arsenic was detected in a parcel of oatmeal whereof the poisoned porridge had been made, and to which the prisoner had access, but was not found in the store whence the parcel was taken.

At other times the examination of the person of the accused leads to detection. A woman, having been poisoned by nitric acid, the stains of this substance were found upon the prisoner. Another important source of evidence is the observation of the period at which the symptoms commence after the administration of the substances supposed to contain

poison. Thus, Dr. Christison gave an opinion that the death of a person poisoned by arsenic was not caused by a particular draught given by the accused eight hours before the symptoms commenced. Subsequent observation, however, has led him to the conclusion that sleep possesses the power of putting off for a while the action of some poisons. "In particular, some instances have occurred to me where arsenic, taken at night, did not begin to act for several hours, the individual having in the mean time been asleep." Where poisoning is effected by repeated moderate doses, this observation of the periods of occurrence of symptoms is very important, especially as chemical analysis may not in such cases be always satisfactory. In Miss Blandy's trial it was proved that the symptoms manifested themselves on each occasion she had administered the gruel to her father. The same correspondence was observed in the recent case of Laffarge. The special period at which symptoms manifest themselves may fix the guilt upon a particular person who might not otherwise have been suspected. Mrs. Humphreys, condemned for poisoning her husband with sulphuric acid, was proved to be the only person who could have obtained access to him just before the poison was poured into his mouth while asleep.

(4) The intent of the prisoner, such as the impossibility of his having administered the poison ignorantly, by accident, or for beneficial purposes. (5) The simultaneous illness of other members of the family. "It may be laid down as a general rule, that, perhaps if two, but certainly if three or more persons, after taking a suspected article of food or drink, are each affected with symptoms, furnishing of themselves presumptive evidence of poisoning, and have been seized nearly about the same time, and within the interval after eating within which poisons usually begin to act, the proof of poisoning is decisive. Several late cases might, in my opinion, have been decided by this rule." The escape of a portion of a party, while others of them suffer, is no proof of poison not having been administered. The poison may have been exclusively placed in the portions of food consumed by those who suffered; while, as Orfila observes, those who had filled their stomachs abundantly with food may suffer less than those who had eaten sparingly, especially if such repletion produced vomiting or alvine evacuations. A severity of symptoms proportionate to the quantities of poisoned substance consumed by different persons, is strong evidence.

(6) Suspicious conduct on the part of the accused during the illness of the person poisoned—"such as directly or indirectly preventing medical advice or relations being sent for, showing too much anxiety not to leave the patient alone with any other person, or attempting to remove or destroy articles of food or drink, or vomited matter, which may have contained the poison, or expressing a foreknowledge of the probability of speedy death." Dr. Christison thus states the duty of the practitioner:—

"In such a conjuncture he is undoubtedly placed in a situation of some delicacy. But, on considering the matter attentively, good reasons will appear why he should adopt the course, which, I believe our courts of justice will expect of him, and keep some watch over the actions of any individual who is suspected of having commited the crime. On the one hand, no one else is, by education and opportunities, so capable of remarking the motions of the different members

of the family dispassionately, without officiousness, and without being observed. And, on the other hand, it is undoubtedly a part of his private duty as practitioner, to protect his patient against any farther criminal attempts, as well as part of his public duty to prevent the vomited matter and other subjects of analysis from being secretly put away or destroyed. No one can be so occupied without many accessory particulars coming under his notice. And certain it is, that on several trials the practitioner has contributed, with great credit to himself, a considerable part of the pure moral proof. For an example of discreet and able conduct under these trying circumstances, the reader will do well to refer to that of Dr. Addington, the chief crown-witness, both as to medical and moral facts, in the case of Miss Blandy. It is almost unnecessary to add that, in acting as now recommended, the physician must conduct himself with circumspection, in order to avoid giving unnecessary offence, or alarming the guilty person."

(7) Suspicious conduct after the person's death, such as hastening the funeral, preventing or impeding the inspection of the body, giving a false account of the previous illness, showing an acquaintance with the real or supposed effects of poison upon the dead body. (8) The personal circumstances and state of mind of the deceased, his death-bed declaration, and other particulars, especially such as tend to prove the impossibility or improbability of suicide. Declarations of the sufferer made to the medical attendant, may be of the most vital import, and cannot be too carefully taken. Dr. Christison particularly dwells upon the importance of this rule in reference to the history of the symptoms, prior to the practitioner being called in.

"On this part of the history, including particularly the time and manner in which the illness began, medical conclusions of extreme consequence are often subsequently founded. On a single fact or two may depend the fate of the prisoner. It is not enough, therefore, in my opinion, that such evidence formed part of the death-bed declaration. If a fact derived at second-hand from the deceased, and stated too by him from memory, is a material element of any of the medical opinions on the trial, it is of much importance that the information be procured by a medical man: and that the person who procured it, whether professional or not, was aware at the time of the probability of its becoming important. Such evidence, although not collected with these precautions, is admissible; but I have so often had occasion to witness the carelessness with which the previous history of cases is inquired into, both in medical and in medico-legal practice, that I do not see how it is possible to put trust in evidence of the kind, unless it bears marks of having been collected with care, and under an impression of its probable consequence."

This section upon the moral or circumstantial evidence is very ably written, and should be diligently perused by every medical man; for notwithstanding the complimentary admission by our author of the excellent nature of the medical evidence upon some trials, its defective character in others is notorious, and that when witnesses of high repute have been under examination too.

We now pass on to notice some of the individual poisons, of which

Arsenic

First claims attention, both from the frequency with which it is employed as the agent of destruction, and from the additional information

respecting it, supplied in the two treatises under review. Of 543 fatal cases of poisoning upon which Coroner's Inquests were held in England during two years, death was caused in 186 by arsenic; in 35 by mineral acids; in 19 by oxalic acid; in 15 by corrosive sublimate and other mercurial preparations; in 9 by various mineral irritants, as tartar emetic, sulphate of iron, &c.; in 9 by vegetable irritants, as colchicum, savine, &c.; in 2 by lytta; in 193 by preparations of opium; in 34 by prussic acid; in 18 by various vegetable narcotics, as nux vomica, strychnia, &c.; in 2 by coal gas; and in 22 by poisons whose nature was not declared. Of 288 cases of poisoning in France, 196 were caused by arsenical compounds.

1. *Tests for Arsenic* (*Arsenious Acid*).—It shows the facility with which difference of opinion may be entertained, even in cases apparently admitting of easy decision, that Dr. Christison and M. Orfila are at issue with respect to the *taste* produced by arsenic. The latter states it to be "rough but not corrosive, slightly styptic, only perceptible at the end of a few seconds, persistent for a long time, and exciting salivation in a marked degree. Dr. Christison is wrong, therefore, in stating it to be insipid." Dr. Christison retorts upon the Professor :—

"The reader will find some details upon this point in a paper I published in the Edinburgh Journal, (vol. xxvii.) In the present work it is sufficient to observe, that I have repeatedly made the trial, and seen it made at my request by several scientific friends; and that, after continuing the experiment as long, and extending the poison along the tongue as far back, as we thought safe, we all agreed that it had scarcely any taste at all—perhaps towards the close a very faint sweetish taste. It appears to me that the experiments made on that occasion, might have set at rest the question as to the taste of arsenic, and corrected an important error long committed by systematic authors in chemistry as well as medical jurisprudence. And accordingly in this country, the truth is now generally known. Professor Orfila, however, continues to repeat the error. * * * * * * * * It is impossible to make satisfactory experiments with safety on its impressions at the back of the palate. But we may rest assured that in general it makes no impression there at all; for it has been often swallowed unknowingly with articles of food. Not a few have in such circumstances noticed merely its grittiness, and thought there was sand in their food. Two instances only am I hitherto acquainted with, where an acrid sensation would seem really to have been experienced in the act of eating or swallowing. It is not improbable that, in an *ex post facto* description, the reporters, as others in the same circumstances have clearly done, confounded the subsequent inflammation with mere taste in the act of chewing or swallowing."

It is not our intention to reproduce here the details of the various tests which are exhibited in all their minutiæ in the works of Orfila and Christison, works which, for all practical purposes of analysis, any abstract would not serve as a substitute for consulting. Arsenic in its *solid* state may be most satisfactorily detected by reduction and subsequent oxidation by which means a 300th part of a grain can be discovered. The alliaceous odour and other supplementary tests are not deserving of retention. Existing in the state of *solution*, this poison may be detected by the *liquid tests*, Hydrosulphuric Acid, Ammoniacal Nitrate of Silver, and Amm[illegible]cal

Sulphate of Copper. Dr. Christison thinks these have been too much neglected of late; for, although any one used alone may be open to fallacies, their conjoint indications are quite satisfactory. By the generation of hydrogen in an arsenical mixture with *Marsh's apparatus*, and subsequently decomposing the arseniuretted hydrogen by combustion, a millionth part of oxide may be detected. The identification of the metallic crust produced by this process has given rise to a great variety of supplementary tests. The process of *Reinsch* by which $\frac{1}{250000}$ gr. may be detected, consisting in precipitating the arsenic on copper, is the simplest and easiest of all, and liable to no important fallacy. In the great majority of instances arsenic has to be detected in *organic mixtures*, such as the contents of the stomach, vomits, &c. Vast additional interest attaches to the subject in the wide field opened for research by the discovery by Orfila, in 1839, (and since repeatedly acted upon both in France and in this country,) of the possibility of detecting this substance within the intimate texture of various organs to which it has been conveyed by absorption. A large portion of the first volume of the "Toxicologie" is occupied in detailing the varieties in the process required for the detection of this poison in its various organic combinations. The method employed in general, consists in the destruction of the animal matters by the agency of nitrate of potash, nitric acid, or sulphuric acid, and submitting the resulting solution to a modification of Marsh's apparatus.

Various *objections*, however, have been offered to the conclusion that the recovering of arsenic from the intimate textures of the frame, is to be considered a proof of the poison having been administered during life; these have been answered at some length by Professor Orfila. 1. *Arsenic* it is said may *exist in the re-agents employed.* This is the case sometimes with sulphuric and muriatic acids, and is said to be so occasionally with nitric acid, nitrate potass, and even zinc. The submitting all materials to be employed to a preliminary examination affords an easy mode of obviating this source of fallacy. 2. *It may be present in some articles of chemical apparatus.* Thus, the iron of the pots recommended by Orfila to be employed, when the analysis is conducted on a *large scale*, contain a little arsenic; but this is not separated from the iron during the processes employed. Both the objection and reply to it, as Dr. Christison observes, are now of comparatively slight importance, for, since the discovery that certain organs and excretions, as the liver and urine, are especially the depositaries of the poison, the submitting of the whole carcase to analysis can never be necessary; and the public will be spared the repetition of the *melo-dramatic* scenes which we think disgraced the tribunals of justice in a neighbouring country during some recent celebrated trials. Dr. Christison may well say, no British Jury would pronounce a prisoner guilty "when the analyst, after boiling an entire body, with many gallons of water, in a large iron cauldron, making use of whole pounds of sulphuric and nitric acids, and nitre, and toiling for days and weeks at the process, could do no more than produce minute traces of the poison. What man of common sense will believe that, with such bulky materials and crude apparatus, it is possible to guard against the accidental admission of a little arsenic." 3. *Arsenic may have existed in the antidote used.*—Thus, a little arsenic may now and then exist in the iron whence the hydrated sesqui-oxide is

prepared. Portions of the stock whence it was taken should be therefore examined. 4. *It may exist naturally in the human body.*—Orfila at one time felt certain he had detected it in the bones, but has never been able to repeat the demonstration. Its normal existence within the bones and in the soft parts has been frequently urged in the French law-courts; but he and most other toxicologists now believe without any foundation in fact. 5. Arsenic has been found by M. Orfila in some *cemeteries*, but as an arsenite insoluble in even boiling water, so that it cannot be believed that this could penetrate into the textures of the body, even when the coffin has been destroyed by accident or time. Indeed, experiment shows how difficult it is to cause even a soluble arsenite to traverse the tissues, when the body continues entire. When this occurs, organs will be found penetrated according to their bulk and proximity, while arsenic resulting from poisoning is found to bear some proportion to the vascularity of the organs it is found in. 6. *The arsenic may have been taken medicinally.*—Here almost everything depends upon the history of the case, as regards symptoms, dose of the arsenic, period of taking it, &c. M. Orfila offers many diagnostic observations upon this point; but we must refer the reader to his work for them.

2. *Of the Action of Arsenic, and the Symptoms it excites in Man.*—Dr. Christison's chapter upon this division of the subject is a most able one, but we can only present a brief ouline of its contents. The operation of arsenic by entering into the blood, before rendered so probable, has been indisputably proved by the discoveries of Orfila. Its action upon this fluid is not well ascertained, beyond the greater degree of fluidity it causes in most cases of poisoning. The heart is the organ remotely acted upon in cases of rapid death following the taking of the poison, while, where life is more prolonged, the general nervous system suffers. It acts with nearly the same energy, whatever texture it is applied to, and death has followed its application to wounds or ulcers, the abraded cuticle, the lining membrane of the rectum, vagina, and air-tubes. So small a quantity as two grains of the white oxide has been said to have caused death, and less quantities produce various alarming symptoms. The action of even large doses much depends upon the state of repletion of the stomach, being far most vigorous when this organ is empty. Dr. Christison divides the cases of poisoning by arsenic into three classes, each manifesting some difference in the nature or course of the symptoms.

1. In the first, and by far the most numerous, class of cases, there is "violent irritation of the alimentary canal, and sometimes of the other mucous membranes also, accompanied by excessive general depression but not with distinct disorder of the nervous system." The person usually survives the 24 hours, but seldom more than three days. In some cases he dies in a very few hours, or lives for weeks. Sickness and faintness usually come on in about half an hour, though sometimes long before, while, in a few cases, especially where sleep has occurred, they have been delayed for two, three, five, or eight hours. We need not follow the train of symptoms here graphically set forth. It will suffice to say that, after those produced by irritation of the alimentary canal have continued a few hours, convulsions and cramps supervene, and the pulse, which was

feeble at the commencement, becomes imperceptible. Delirium or stupor often accompany the advanced stage: and, after the horrid agonies of the early stage of the affection, death is frequently calm enough. The symptoms in these cases are usually uniform, but in some rare cases, even pain and vomiting have been entirely wanting.

2. In the second set of cases there is little sign of irritation of the alimentary canal—excessive prostration with fainting being the principal feature, and death occurs in five or six hours, before inflammation can have developed itself. In a few cases the symptoms have approached to narcotism, as they did in some of Brodie's experiments. This variety of poisoning has been observed only when the dose has been very large, when it was in little masses, or when it was in solution. These cases are not common, but should command the attention of medical jurists, as an erroneous opinion still too generally prevails, that poisoning by arsenic *always* produces violent and well-marked symptoms.

3. In this set of cases there are two distinct stages in the progress of symtoms, first the signs of inflammatory action, ordinarily violent, of the alimentary canal, followed, on the second, fourth day, or later, by those of affections of the nervous system, *e. g.*, palsy or epilepsy. These are usually cases in which a small quantity has been taken, or prompt vomiting is induced. Usually, recovery eventually takes place, although death may follow a protracted illness. The nervous affection may show itself during the existence of the inflammatory action.

We extract some of Dr. Christison's valuable remarks upon the strength of evidence supplied by symptoms in arsenical poisoning.

"The present doctrine of toxicologists and medical jurists seems generally to be, that symptoms alone can never supply decisive proof of the administration of arsenic. This opinion is certainly quite correct when applied to what may be called a common case of poisoning with arsenic, the symptoms of which are little else than burning pain in the stomach and bowels, vomiting and purging, feeble circulation, excessive debility, and speedy death. All these symptoms may be caused by natural disease, more particularly by cholera; and consequently every sound medical jurist will join in condemning unreservedly the practice which prevailed last century of deciding questions of poisoning in such circumstances from symptoms alone. But modern authors appear to have overstepped the mark, when they hold that the rule against deciding from symptoms does not admit of any exceptions. For there are cases of poisoning with arsenic, not numerous certainly, yet not very uncommon neither, which can hardly be confounded with natural disease; and, what is of some consequence, they are precisely those in which the power of deciding from symptoms alone is most required, because chemical evidence is almost always wanting. Either the peculiar combination of the symptoms is such as cannot arise from natural causes, so far at least as physicians are acquainted with them; or these symptoms occur under collateral circumstances, which put natural causes almost or altogether out of the question."

In illustration of this opinion, Dr. Christison refers to some cases in which affection of the whole of the mucous membrane followed the taking certain substances; and others, in which distinct nervous affections followed the inflammatory one. That such should arise from ordinary disease is hardly possible, unless the cause be also known.

"But to conclude, there are likewise collateral circumstances connected with

the symptoms, which, taken along with the symptoms themselves will sometimes place the fact of poisoning with arsenic beyond the reach of a doubt. Thus, if a person were taken several times ill with symptoms of general inflammation of the mucous membranes, after partaking each time of a suspected article of food or drink, the proof of the administration of arsenic would be very strong indeed; and it would be unimpeachable, if at length a nervous affection succeeded at the usual period. Or above all, suppose several persons, who have partaken of the same dish, are seized about the same time with nearly the same symptoms of irritation of the mucous membrane. The proof of general poisoning would then be unequivocal. And if one or more of them should afterwards suffer from a nervous disorder, little hesitation ought to be felt in declaring that arsenic is the only poison which would have caused their complaints."

The case of Miss Blandy may be cited as an example of the first, and that of Eliza Fenning of the last of these statements.

3. *Morbid Appearances.*—We regret we cannot pursue the interesting detail of these, given by Dr. Christison; but we have only space to extract his opinion of their juridical value:—

"On reviewing what has been said of the pathological appearances caused by arsenic, it must appear that the medical jurist can never be supplied from this source alone with satisfactory evidence of the cause of death. But, in some circumstances, the evidence may amount to a strong probability of one variety or another of irritant poisoning. Mere redness, conjoined or not with softening of the mucous membrane, may justify suspicion only. But if there should be found in the body of a person who has died of few days' illness, redness, black warty extravasation, and circumscribed ulcers of the villous coat of the stomach,—effusion of blood or bloody clots among the contents of that organ,—also redness of the intestines, more especially redness and ulceration of the colon and rectum,—and redness of the pharynx, or of this along with the gullet,—the proof of poisoning with some irritant will amount to a strong presumption. At least, it is difficult to mention any natural disease which could produce, in so short a time, such a conjunction of appearances as this; which arsenic and other analogous poisons sometimes occasion."

There are some good remarks upon the remarkable preservation from decay poisoning by arsenic confers upon the corpse. This might be made a corroborative proof; and is at all events a fortunate circumstance, for the poison may be detected in the undecomposed body months or years after death.

We may subjoin a caution, delivered by Professor Orfila, as to one morbid appearance, which has sometimes been a source of error. He says:—

"I cannot quit this subject without observing that, under certain circumstances, there is observed, here and there, in the stomach and intestines of persons poisoned by arsenic, a number of brilliant points, which one would at first be tempted to believe to be arsenious acid. These grain-like bodies are formed of fat and albumen. Placed on live coals, they decrepitate with a noise which has improperly been termed detonation. They inflame when they contain a large proportion of fat, and give out an odour of burning animal matters. They are found also in the bodies of persons who have not been poisoned. Billiard has seen them in two women: one of whom, aged 72, died of chronic gastro-colitis; and the other, aged 50, of phthisis, having many ulcers in her intestines."

4. *Treatment of Poisoning with Arsenic.*—Several substances have been

proposed from time to time as antidotes for arsenic, such as sugar, lime-water, oils, liver of sulphur, or sulphuret of potassium, &c.; and M. Orfila has exposed at large their inefficacy. Magnesia, or charcoal given in large quantities shortly after the poison has been swallowed, seems sometimes to have been of use, by covering the particles of the arsenic with its insoluble powder. But the only substance which has any pretension to the character of *an antidote*, is the ***hydrated sesquioxide of iron***, which, brought in contact with oxide of arsenic, forms an arsenite insoluble in the secretions of the stomach. Some difference of opinion as to the beneficial effects of this substance has been entertained among observers. But when it has been resorted to sufficiently early, its inefficacy would seem often to have arisen from insufficient doses having been employed. To remove one part of arsenic from a state of solution, twelve parts of oxide in its moist state, and sixty parts, if previously dried, are required. Orfila states that the resulting arsenite is somewhat soluble in the secretions of the stomach, and is poisonous to animals; but that this effect may be counteracted by giving the oxide in excess, so that the compound may be thrown down again as fast as dissolved. This antidote has been found repeatedly successful, and should be kept ready prepared by every druggist.

An antidote, however, can seldom be had recourse to early enough, and if spontaneous and free vomiting do not occur, it must be excited by emetics, administering at the same time milk in considerable quantities for the purpose of enveloping the poisonous matter. Emetics are not required, if natural vomiting exists; and the stomach-pump possesses no advantage over either. When the poison has been evacuated, we have the inflammatory state of the alimentary canal to deal with; and the active antiphlogistic measures indicated for its relief may be injurious in the condition of great prostration which usually prevails. Still, active venæsection seems to have saved several cases. Orfila recommends it as a means of removing a portion of the poison circulating with the blood; but forbids it prior to the due evacuation of the stomach, as absorption would be increased, as also when all degree of reaction is absent. Rasori and Rognetta recommend the stimulant mode of treatment; Orfila, as the result of 157 experiments on dogs, declares such treatment as useless, and even prejudicial. "At the same time," as Dr. Christison observes, "no one who has ever seen a case of poisoning by arsenic, can doubt that it is often necessary to counteract the overwhelming languor of the circulation by the moderate use of stimulants."

Dr. Christison suggests that, where the poison has been all evacuated, and the patient's strength admits of it, copious depletion, followed by full *opiates*, would form proper treatment, just as in ordinary inflammation.

Professor Orfila lays great stress upon the free employment, *after the active evacuation of the poison*, of a *diuretic potion*, composed of 10 pounds of water, 5 of French white wine, a bottle of Selzer, and 3 oz. of nitre, the dose being two wineglassfuls frequently. He says :—

"If this were taken abundantly during the early stages of poisoning, it would have the serious inconvenience of dissolving the arsenious acid and favour its absorption. The utility of this plan cannot be contested after the numerous experiments I have tried. It may be seen in my memoir in the Archives Generales,

Sept. 1841, that all the animals poisoned by the external application of arsenic, who would have died had they been left to themselves, recovered in a short space of time, after I had succeeded in obtaining an abundant passage of urine from them: and it will be observed that the urine, especially that passed during the first few days, contained notable portions of arsenic. Here experience confirms what theory would predict; for, in expelling the arsenic through the urinary passages, which is ready to destroy the vitality of organs, one acts as surely, as when we seek to remove it from the alimentary canal by vomiting and purging."

M. Agouard relates a case in the human subject successfully treated on this principle.

OXALIC ACID.

It is somewhat surprising, considering the far greater rapidity and certainty of its action, that this substance is not much more frequently employed than arsenic for the purpose of suicide or murder. In the great majority of cases it has been taken inadvertently for sulphate of magnesia. Such accidents cannot be guarded against by attention to the different physical appearances of the two substances, for Dr. Christison observes, "that repeatedly, on desiring several persons to point out which was the poison and which the laxative, I have found as many fix on the wrong as on the right parcel." The acid taste and inferior solubility of the poison are safer guides.

Oxalic acid acts very differently, accordingly as it is employed in a concentrated or diluted condition. Given to dogs in the former state, it causes dreadful pain and effort to vomit, and if the dose is large, produces death in from two to twenty minutes. The stomach is found to contain black extravasated blood, the surface of its inner coat being brittle in places, having the subjacent stratum gelatinized. Diluted with twenty parts of water, the acid exerts scarcely any irritating effects upon the stomach, death, however, no less certainly resulting, the heart, spine, and brain being the organs affected. It produces nearly the same effects to whatever texture it is applied. It has never been detected in the blood; and although Orfila detected it in the urine, he has never found it in the liver and spleen.

In man, recovery from this poison is rare, where the dose is considerable, and that even in cases where abundant vomiting comes on at once. Death has occurred as soon as ten minutes, and few who take large doses survive more than an hour, although some remarkable exceptions are on record. Among fatal cases, the smallest dose hitherto taken has been half an ounce. Although signs of violent irritation of the alimentary canal are usually discovered after death, in some cases none whatever have been observed.

Owing to the rapid action of this poison, *treatment* is too often out of the question. The administration of an antidote which produces with the acid an insoluble compound, as chalk or magnesia, or in default of either, plaster from the wall is indicated. Alkalis, forming soluble oxalates are inadmissible. When the former are at hand, time must not be lost in exciting vomiting, or in using the stomach-pump, which "fashion seems

to have authorised the employment of for every kind of poison;" and care must be taken not to increase the solubility of the poison by encouraging vomiting by the ingestion of large quantities of fluid. Poisoning by oxalic acid, Dr. Christison states, may be inferred from symptoms alone.

"If a person, immediately after swallowing a solution of a crystalline salt, which tasted purely and strongly acid, is attacked with burning in the throat, then with burning in the stomach, vomiting, particularly of bloody matter, imperceptible pulse and excessive languor, and dies in half an hour, or still more in 20, 15 or 10 minutes, I do not know any fallacy which can interfere with the conclusion, that oxalic acid was the cause of death. No parallel disease begins so abruptly and terminates so soon; and no other crystalline poison has the same effects."

Professor Orfila enters at considerable length into the examination of the tests for the presence of this substance, and the fallacies which the existence of binoxalate of potash in sorrel soup, so much used in France, may give rise to. Rhubarb-root, too, contains always some, and sometimes a large proportion, of oxalate of lime.

CORROSIVE SUBLIMATE.

All the circumstances relating to this and other mercurial poisons are very elaborately developed by both Dr. Christison and M. Orfila; but we can only allude to a few of them. Before the discoveries consequent upon Orfila's improved modes of analyses, it had been long believed that this and other mercurial preparations acted through the medium of the blood. Many instances, some very hypothetical, have been narrated of live quicksilver being discharged from the body during a mercurial course; and others, where this fluid was found in the bones after death. Buchner and Schubarth stated that they had obtained mercury from the blood and other fluids; but competent observers have not been able to do so in employing these processes. Orfila, though unable to detect it in the blood, has repeatedly found it in the urine and liver of animals poisoned by, or of patients taking, the sublimate. The corrosive sublimate, when swallowed in poisonous doses, produces violent corrosion of the stomach, "and, however introduced, causes irritation of it and the rectum, inflammation of the lungs, depressed action, and perhaps inflammation of the heart, oppression of the functions of the brain, inflammation of the salivary glands." Frequently resembling *arsenic* in its corrosive action, it differs from it, inasmuch as the taste it causes, and the irritation and acridity it produces in the act of swallowing are instant and far more marked, so as sometimes to have led to a timely desisting. The countenance is not ghastly, but flushed; and the discharge of blood by vomiting and purging is more frequent. The urinary passages are more irritated, and the nervous symptoms are more apt to come on during the inflammatory stage. Recovery after even large doses is more frequent, and deviations from the ordinary course of symptoms more rare.

Dr. Christison believes that symptoms alone will sometimes supply sufficient evidence of poisoning by sublimate.

"If after something has been taken which tasted acrid, and caused an immediate sense of heat, pricking, or tightness in the throat, the characteristic signs

of poisoning with the irritants (especially if these are attended with the discharge of blood upwards and downwards) make their appearance in the usual time, and are soon after accompanied or followed by true mercurial salivation,—it may be safely inferred that some soluble compound of mercury has been taken. Before drawing this inference, however, it will be necessary to determine with precision all the classes of symptoms, more particularly the nature of the salivation. It should also be remembered, that salivation may accompany or follow the symptoms of inflammation in the stomach, in consequence of calomel having been used as a remedy. But if proper attention be paid to the fallacies in the way of judgment, I conceive that an opinion on the question of poisoning with corrosive sublimate may be sometimes rested on the symptoms alone."

Treatment.—M. Orfila, having proved the inefficacy of the various antidotes formerly in use, was fortunately enabled some years since to discover a very efficacious one in an accessible substance, namely, the *albumen* contained in whites (and yolks) of eggs. This has saved several lives. He observes: 1. The precipitate of albumen and the sublimate may be taken in a large dose without danger. 2. It is poisonous (but less so than the sublimate) when dissolved in excess of albumen. 3. Therefore, animals to whom more albumen than sufficient to produce the precipitate, is given, die, if they are prevented vomiting. 4. Dogs poisoned with sublimate, to whom excess of albumen is given, in consequence of the vomiting which the combination produces, survive. 5. Animals to which an insufficient quantity of albumen has been given, die in three or four hours. 6. Although albumen does not completely neutralize the poison, it is by far the best antidote discovered, because it is harmless in itself, does not form a hurtful compound unless in excess, and because, being accessible to all, it can at once be swallowed off. Dr. Wright says, that if its administration be followed up by an astringent decoction, or infusion, the solubility of the compound in excess of albumen is diminished. In a case of poisoning, eggs copiously diluted with water, or in a gum emulsion, should be given, and the stomach distended with fluid, so as to induce vomiting. If eggs are not at hand, rice-water, flour and water, sugar and water, or milk may be used. Vomiting is better excited in these cases by *abundant drinks*, which allay irritation, than by emetics. They should be therefore even forced upon the patient. If the taking the poison be followed by inflammation of the alimentary canal or peritoneum, general and local bleeding, fomentations, and anodyne or emollient glysters will be required. Edwards and Dumas state they have found iron filings an efficacious antidote in their experiments. In a supplement, Orfila notices the *protosulphuret of iron*, recommended as a good antidote by M. Mialhe; and declares—1. That it quite destroys the poisonous properties of the sublimate, if taken in a sufficient dose immediately. 2. It is inefficacious if not given within ten minutes. 3. Although a more complete antidote than albumen, if given instantly, in almost every case it could not be procured until the latter had already begun to produce its beneficial effects.

Lead

We shall confine ourselves here to a brief abstract of Dr. Christison's

researches upon the action which water and acids, under different circumstances, exert upon metallic lead.

1. *The Action of Air and Pure Water.*—Lead exposed to the air, especially when moist, becomes tarnished by the deposit of a thin layer of carbonate of lead. Distilled water, deprived of air by ebullition, has no action on lead. If the water contain its usual gases, the surface of the metal becomes white and dull, and if it continues to have access to the air, copious white matter floats on the water or falls to the bottom. This, a corbonate of lead, forms with great rapidity. In twenty months 120 grains have been obtained from one ounce of lead kept in 24 ounces of distilled water. During all this, a minute quantity of lead is dissolved. Distilled water, therefore, for economical use, should not be kept in contact with lead.

2. *Action of Solutions of Neutral Salts.*—These impair the corrosive power of water, enabling us to employ lead for various economical purposes. The degree of preservative power varies much in different salts. Arseniate soda possesses it perfectly in the proportion of a 12,000th part. Phosphate of soda and hydriodate of potash are nearly effectual *in the* proportion of a 30,000th. Acetate of soda is only imperfectly so *in 100th.* Muriate of soda is a preservative in 200th part, and sulphate of lime in a 4000th. Lead, exposed for a few weeks to a solution of the protecting salt, acquires a film, after which even distilled water possesses no power over it. The protecting power depends upon the acid, not on the base of the salt, those salts possessing most preservative power, whose *acids form* with the lead insoluble salts. No lead can ever be detected in even weak preservative solutions.

"The general result of these experiments appears to be, that neutral salts in various, and for the most part minute, proportions, retard or prevent the corrosive action of water on lead—allowing the carbonate to deposit itself slowly, and to adhere with such firmness to the lead as not to be afterwards removeable by moderate agitation—adding subsequently to this crust other salts of lead, the acids of which are derived from the neutral salts in solution—and thus at length forming a permanent skreen, through which the action of the water cannot any longer be carried on."

3. *Action of Natural Waters on Lead.*—Lambe stated erroneously that *Rain* or *Snow Water* does not corrode lead. Collected in its pure state in the country, it acts nearly as powerfully upon any leaden gutter or receptacle as distilled water would do; and even in towns, where the presence of some preservative salt may cause a protective incrustation of carbonate of lead, this may become dissolved by the water, if any acid emanations, from manufactories, &c., exist in the neighbourhood. From the presence of muriates and sulphates, *Spring Waters* usually exert little or no action upon lead, although many examples are upon record in which, owing to the salts they contained being but of a very feebly protecting character, colic and other symptoms of lead-poisoning have resulted from their employment; and Dr. Lambe, amidst many valuable observations, erroneously comes to the conclusion, that all spring water acts thus prejudicially

upon lead. This action of the water upon lead often occurs when it is kept constantly in contact with it, as in cisterns, (manifesting its action especially on the lids of these when of lead,) perhaps for months, while by merely passing over the metal it would have produced no effect upon it. Too pure spring water may thus often have this property of acting upon lead corrected by allowing it to remain in contact with the leaden receptacles for some months before it is drawn off, so that it may deposit a protecting crust of carbonate; or by filling the cisterns, &c., during the same period, with a solution containing $\frac{1}{25000}$ phosphate of soda. All risk is avoided by a recent patent process for lining and covering pipes with a thin coating of tin.

4. *Action of Acidulous Fluids on Lead and its Oxide.*—The effect of *carbonic* acid is not well ascertained. Water feebly acidulated with *sulphuric* acid acts much less rapidly on lead than when pure, while *hydrochloric* acid slightly favours the solvent power. *Acetic* acid, even when much diluted, dissolves metallic lead, provided its oxidation be effected by due exposure to the air. *Citric* acts more slowly, and *Tartaric* still more so. These vegetable acids act much more vigorously on the *Protoxide of Lead,* while the presence of air is not then required. In consequence of this action of the vegetable acids, articles of food are often rendered poisonous, as *e. g.*, milk, wine, cider, when brought in contact with it. Lead is now abandoned in the manufacture of cider-apparatus in this country: but the adulteration of this drink in France with lead gave rise very recently to the production of colic. The metal is also much used there for the correction of the acidity of inferior wines.

Hydrocyanic Acid.

The great increase of cases of poisoning by this substance of late invests it with great importance. The *tests* of its presence are its odour, the salts of copper, salts of iron, and nitrate of silver. The *odour* is a very delicate test, and, according to Orfila, is perceptible when no re-agent is delicate enough to detect it. Dr. Christison doubts this, and has "known some persons insensible of any smell, even in a specimen which was tolerably strong. Hence, when the odour is resorted to as a test, it ought to be tried by several." *Sulphate of Copper* and a little potash form a greenish precipitate with prussic acid, which becomes nearly white on the addition of hydrochloric acid. Lassaigne states this will act on poison dissolved in 20,000 parts of water. This is a far inferior test to the salts of the *mixed peroxide and protoxide of Iron,* which on the addition of a little sulphuric acid, give a deep Prussian blue colour. Common green vitriol answers very well. *Nitrate of Silver* is a very delicate test—the cyanide of silver being insoluble in any but boiling nitric acid, by which it is decomposed, forming nitrate of silver, and giving out prussic acid. Or, if the precipitate be dried and heated, it gives out cyanogen gas, known by its beautiful rose-coloured flame. MM. Leuret and Lassaigne and Orfila have each devised processes for detecting prussic acid in mixed fluids. Orfila protests against the conclusions which have sometimes been drawn as to the

presence of this substance without the production of cyanogen gas, leaving the case as imperfect as if in testing for poisoning by arsenic the metal was not produced. He also demands whether the detection of the poison in the vomits, alimentary canal, or liver of a person supposed to have died poisoned, is sufficient to prove poisoning to have occurred. He replies it is not, for—1. It has been occasionally known to be developed in some of the secretions in persons in a state of health or even a diseased condition. 2. It has not been proved that this acid may not be generated during the process of putrefaction. He admits this last observation is of little practical value.

Action and Symptoms.—Dr. Christison has endeavoured, in repeating Magendie's experiments with concentrated acid, to mark the periods of the commencing operation of the poison, and when death occurs. He says:—

"I remarked that a single drop, weighing scarce $\frac{1}{3}$ gr. dropped into the mouth of a rabbit, killed it in 83 seconds, and began to act in 63 seconds—that 3 drops weighing $\frac{4}{5}$ gr. in like manner killed a strong cat in 30 seconds and began to act in 10,—that another was affected by the same dose in 5 and died in 40 seconds,—that 4 drops weighing 1 gr. $\frac{1}{4}$ did not affect a rabbit for 20 seconds, but killed it in 10 more,—and that 25 grs. corresponding with $1\frac{1}{2}$ oz. medicinal acid, began to act on a rabbit as soon as it was poured into its mouth, and killed it outright in 10 seconds at farthest."

Magendie has killed animals apparently instantly, and Dr. Thompson in 2 seconds. Mr. Blake declares all experiments representing the action of the poison to have begun before 10 seconds are fallacious, as he could never succeed in inducing action in less time even by injecting 30 minims into the femoral veins. But, as Dr. Christison well remarks, *negative* results cannot outweigh careful positive observation. In the rapid cases death took place just as tetanic symptoms, which prevail in slower cases, were commencing. Diluted acid produces the same effect when the dose is large enough. When it is smaller the animal may suffer from giddiness, insensibility, or convulsions from half an hour to a whole day. The acid acts on the brain and on the spine, producing the combination of coma and tetanus. There are few morbid appearances beyond turgidity of the cerebral vessels, and a distension of the heart and large vessels by black blood. There is difference in the statements of different observers, as to whether the irritability of the heart is exhausted or not. All animals, high or low in the scale of the creation, are destroyed by it, and much in the same manner. It is not believed to be a cumulative poison. In man, large doses extinguish life in a few seconds, or at all events in a few minutes; but if the individual survives 40 minutes he usually recovers. The fixing the period when the poison begins to act, is often a very important point in medico-legal investigations; and some very recent cases, observed by Dr. Letheby and others, would seem to show that more actions may be performed after taking large doses prior to the occurrence of death than was heretofore believed possible. In some of these, however, the exact quantity taken is a mere matter of uncertain inference and conjecture. The fixing the smallest fatal dose is important. Seven epileptics were killed in a Parisian hospital by the administration of $\frac{9}{3}$ gr. of pure acid to each, and as several did not die for 45 minutes, a less dose would probably not be fatal.

The peculiar appearance of the eye some have laid so much stress upon, is thus commented upon:—

"It appears that even long after death the eye, as in Hufeland's case, has a peculiar and staring expression, so as to render it difficult to believe that the individual is really dead: and this has been considered by Dr. Paris as so remarkable, as even alone to supply 'decisive evidence of poisoning by hydrocyanic acid.' But the accuracy of his opinion may be questioned. The appearance is indeed very general in cases of poisoning with preparations containing hydrocyanic acid. But it is not a constant appearance; for it was not observed in the seven Parisian epileptics. Neither is it peculiar; for death from carbonic acid has the same effect. I have remarked it six hours after death in a woman who died of cholera; and it has been observed in cases of death during the epileptic paroxysm."

Treatment.—This is too often hopeless on account of the rapidity of action of large and dangerous doses. The recommendation of emetics and enemata in these cases by Orfila is unintelligible. The necessity of arousing the depressed powers of the system suggested the employment of *ammonia;* but the experiments of Orfila tend to show this is only useful when instantly inhaled (1 part ammonia 12 water) and not swallowed. The remedy originated however with Mr. Murray in 1822. In the same year, too, Rianz proposed the inhalation of *Chlorine*, and Orfila has saved dogs when dying, by causing them to inspire water impregnated with a fourth of its volume of chlorine. *Cold affusion* is another important means of arousing the failing powers. The coldest water should be procured, and poured upon the head and spinal column; keeping a bladder filled with ice also to the head. Mr. Banks has published a case (Ed. Journ. vol. 48,) in which recovery followed the use of this means. Orfila seems to regard *venæsection* only as proper during the ulterior treatment of the case; but others, in experiments upon animals, have found the opening the jugular vein a powerful means of relieving the engorged condition of the right side of the heart, and thus restoring its action.

"Few observations have hitherto been made on the *chemical antidotes* for hydrocyanic acid, or those substances which render it innoxious by converting it into an insoluble compound. It is plain that several probable antidotes of this kind exist. But toxicologists have been apparently deterred from trying them by the fearful rapidity with which the poison acts, and the consequent improbability that in practice such an antidote can be administered in time. It has lately been shown, however, by Messrs. Smith of this city, that the effects of a fatal dose may be warded off by the timely administration of the re-agents necessary for converting the acid into Prussian Blue. They found that if a solution of carbonate of potash, followed by a solution of the mixed sulphates of iron, be given to animals very soon after the administration of thirty drops of the Edinburgh medicinal acid, containing 3 per cent. real acid, recovery in general takes place, and sometimes little inconvenience seems to be sustained. The solutions they used were one of 144 gr. carb. pot. in 2 ℥ water, and another composed of ʒj½ sulph. protox. iron, together with ʒij. of the same salt converted in sulph. of sesquioxide by means of sulphuric and nitric acids in the usual way. About 52 minims of each solution will remove the whole acid contained in 100 gr. of Ed. medicinal acid; but for certainty, three or four times as much should be used—which may be done with perfect safety."

We need not say more in commendation of the two standard works whence we have borrowed so largely, save to repeat what a more particular

examination impresses, that however necessary Professor Orfila's work is for reference, Dr. Christison's is a very superior guide for the general practitioner and student. We have not quoted from Dr. Guy's "Principles," as it is but a condensed (too concentrated for our taste) compilation, useful chiefly to those who are attending his class, but devoid of original matter.

The tenth edition of Mr. Stowe's well known "Toxicological Chart" has just been published, with the various additions which the progress of the science has enabled its author to make. He has not, however, inserted the new antidote for prussic acid which we have transcribed above, and we are not quite sure the *practical* utility of the chart will be diminished by its omission. To young beginners a synopsis of this kind is indispensable.

In concluding this article we may be allowed to give expression to a hope, that the time is not far distant, when some attempt will be made to place some restriction upon the *right of selling drugs*, and especially those of a *poisonous nature*. We are quite aware that murder and suicide by poisoning will not thus be wholly prevented, but we feel certain that much may be done for their diminution. Who can doubt that the present disgraceful facility in obtaining these dangerous substances has wonderfully aided the murderer in his diabolical projects? And who does not know that long premeditated suicide is the exceptive case, and that the deed would be often prevented, were the seeker after poison submitted to searching investigations, or compelled to reflect by reason of the delay which the difficulty of obtaining the instrument of destruction entailed upon him? The censure of the Coroner's jury, unattended by any penal consequences, is of no use whatever; for it is quite certain that men, who for a few wretched pence, place these dangerous weapons in the hands of malice or ignorance, are far removed from any wholesome influence conveyed by a reprimand. Among other precautions, the imitation of the practice reported by Sir George Lefevre, as followed in Russia, of dispensing all dangerous compounds in peculiarly colored bottles or papers, would at least prevent accidents.

TEXT BOOK OF ANATOMY FOR STUDENTS. By *Alexander Jardine Lizars*, M.D., Professor of Anatomy in the Marischal College and University of Aberdeen. Parts 2 and 3. 1844.

Under the unpretending title of a Text Book, Dr. Lizars has rendered a very acceptable service, by giving to the student a clear exposition, not only of the descriptive anatomy of the body, but likewise a concise enumeration of the more important points connected with the minute structure of the several organs and their actions. We have always thought it desirable that, even in elementary works, some reference should be made to structural anatomy and physiology; not only because the tedium which attaches to a bare description of the processes of a bone or the attachments of a muscle, is considerably relieved by knowing something of that beautiful mechanism which their intimate texture reveals, but more espe-

cially because the future practitioner will, in the investigation of disease, find more demand made upon his knowledge of what has been well-called *physiological anatomy*, than upon his acquaintance with the topographical and surgical anatomy, all-important as they are in themselves.

In the work before us, we are also glad to perceive that the author has incorporated the more essential part of the various discoveries and additions by which the science of anatomy has of late years been enriched; so that, after going through a minute account of the divisions of an artery or the twigs of a nerve, the reader is refreshed by arriving at some novel and interesting sketch from which he cannot fail to derive pleasure and instruction. But in thus rendering available the results of modern discovery, the plan of the work is never sacrificed.

The objects of the author are thus stated :—

"Having had ample opportunities of observing how much Students are generally occupied during lecture time in taking notes of the Anatomical Demonstrations which are then being delivered, I have prepared the present Treatise with the view of saving them that trouble."

"This little work will enable the student to follow lectures on Anatomy with, I trust, every possible facility; and will supply him, at the termination of his studies, when his time is invaluable, with the readiest means of reviewing this branch of Science within the narrowest limits. In the execution of my task I have steadily aimed at the greatest degree of conciseness compatible with the requisite minuteness, and with accuracy; and utility has been the great and constant object of my ambition."—*Preface.*

Although the general character of the work before us, enables us to express a favourable opinion of its merits, yet there are some occasional errors and omissions which require correction. Among the former, we regard the statement that the rete mucosum "is unorganized, and is evidently a secretion of the dermis." (p. 275.) There can be no doubt, on the contrary, that the *rete Malpighii* is composed of distinct cells, which, are doubtless extra-vascular; but to call such a structure in the present day unorganized, or a secretion, is incorrect. Again, the structure of the cornea is thus given—"it is composed of six lamellæ, having a fluid in minute quantity between them." (p. 291.) Now, although a minute account of texture would have been misplaced in a text-book, yet, in an enumeration of the component parts of an organ, all that do exist should have been named; but we have here no notice of the epithelium covering the outer surface, nor of the membrane of Demours and layer of tesselate epithelium which exist upon the posterior surface. These, and some other omissions of similar kind are, however, of a trifling nature, and are redeemed by concise and yet comprehensive descriptions of the several organs.

The anatomy of the brain is illustrated by some tabular classifications, which may assist the student in acquiring a technical acquaintance with the names and relations of the fissures, lobes, &c.

The structure of the spinal cord is well given, and many of the more recent views respecting its minute texture and functions are briefly expressed. The physiology of this important organ is thus described :—

"THE FUNCTIONS of the spinal cord are, 1, Nervous impression,—2, Nervous power,—3, Sensation,—4, Volition.

"1. *Nervous Impression.* Impression made upon the various parts of the trunk and limbs may be transmitted to the cord, without the consciousness of the individual; as happens in diseases where the mental faculties are suspended.

"2. *Nervous Power*, or nervous energy, is the function whereby a stimulus is sent to certain muscles so as to excite their contractions. This either follows the preceding, or volition. The movements of the various muscles connected with the organs of relation are produced by this power; and those also it is said of the muscular fibres of the organs of nutrition. That it exists independent of volition is proved by movements being produced against the will; also by certain diseases of the cord, wherein the individual has the *will* but not the *power* to effect the movement; and by those affections of the brain, where volition is lost, while this function remains.

"3. *Sensation* is the perception of an impression of which the individual is conscious. The cord assists in the performance of this function only so long as its connection with the brain is maintained.

"4. *Volition*, the function which at certain times precedes the actions of the voluntary muscles, is performed by the cord only so long as it is connected with the brain." P. 352.

The third and concluding part of the work contains the organs of nutrition and generation, and the style in which these subjects are treated will be comprehended by a few selections.

The teeth are, by Dr. Lizars, very properly described with the digestive organs, with which they are not only connected in function, as instruments for masticating the food, but by their relation to the mucous membrane. The dental organs, if examined only in the adult and in the human body, would probably be regarded, as indeed they often have been, as appendages to the skeleton; but comparative and developmental anatomy teach us, what Hunter had long since inferred, that they are parts of the tegumentary membranes. Thus in many animals they are unconnected with the jaws, being placed in numerous fishes on the tongue or in the pharynx; and in several molluscous and articulate animals they are even implanted on the mucous surface of the stomach, of which a familiar example is furnished by the common lobster. Again, the valuable researches of several late observers, especially those of Mr. Goodsir, have shown that the teeth are formed, not like the bones, but from papillæ, like the hairs implanted in the skin.

With the stomach and intestinal canal, in addition to the usual descriptive anatomy, a brief account is given of the epithelium, villi, and the various glands, such as the gastric, duodenal, those of Peyer, Lieberkühn, and so forth. There is also appended a sketch of the physiology of each organ. The organization of the liver is well described, according to the views of Mr. Kiernan, which although rendered doubtful in some parts by the recent inquiries of Henle, Bowman, Weber, and Krukenberg, are still deserving of close attention.

In the section upon the kidney there is an omission which the author would do well to rectify in another edition; we allude to the absence of all notice of the important researches of Mr. Bowman, which have thrown an entirely new light upon the character of the Malpighian bodies, and especially upon the renal circulation. The views of Müller and other German physiologists, who attribute free cœcal extremities to the cortical

tubules, are also adopted, although the subsequent researches of Professor Owen and others have rendered it very probable that such a disposition does not really exist.

The Chapter on the organs of respiration contains a recapitulation of the several structures of the lungs. The part relating to the bronchial tubes is at once concise, clear, and correct, although we differ from Dr. Lizars when he says, adopting the views of Reisseissen, "each minute tube terminates in a vesicle or cul-de-sac very slightly if at all dilated, and a number of these are collected together, so as to form what is termed a bronchial lobulus." (p. 528). We refer our readers for what we believe to be a more correct statement of this interesting part of structural anatomy to our notice of Dr. Carpenter's treatise on Physiology.

A full account is given of the distribution of the vascular system, but as this admits of little novelty, one or two extracts will be sufficient to show the plan the author has adopted of simplifying the study of these parts of the body. The distinctive character of the capillaries are well-defined in the following passage;—"they (the small arteries) ultimately terminate in a series of minute vessels named *capillaries*, the walls of which are of exteme tenuity. The size of the different capillaries varies from $\frac{1}{1000}$ to $\frac{1}{3000}$ of an inch; but each capillary is of the same calibre throughout its whole length; they neither diminish, like arteries, nor increase, like veins, and they frequently unite or anastomose with each other, so as to form a net work, by which the distribution of the blood is facilitated." (p. 585.)

A tabular summary is appended to the account of all the blood-vessels, nerves, &c., which is well calculated to facilitate the progress of the student.

A description of the cavities, textures, and action of the heart, arteries and veins, is prefixed to the account of the blood-vessels. The minute anatomy of the heart is full and comprehensive, but we think that the author should, instead of tracing the carneous fibres from the interior of the organ have followed them in the mode which is not only the most obvious but also the only effective one, namely, from the exterior, inwards.

The ganglionic or sympathetic system of nerves is considered after the organs of circulation, and we have the following exposition of the more essential parts of this system, which, for correct and judicious views, might compete with many more elaborate and pretending productions:—

"STRUCTURE OF THE GANGLIONIC NERVES. These nerves are composed of three different kinds of threads or fibres, to which the names of sensific, motific, and organic, are applied.

"*The Sensific Fibres* are obtained from the cerebro-spinal axis, through the medium of its nerves, a few being furnished by some of the cerebral, and the majority by the spinal nerves, the posterior roots of all of the latter giving off fibres. These are of a white colour and tubular form, the nervous matter being contained in minute canals formed of fine cellular tissue.

"*The Motific Fibres* are also derived from the cerebro-spinal axis, certain of the cerebral nerves giving a few, and the anterior roots of all the spinal nerves the greater number. In form and colour they resemble the last.

"*The Organic Fibres* arise in the ganglia of this system. They are much more minute than the two preceding fibres, and, when examined with the microscope, are found to differ from them, in not being composed of a tube with nes-

vous matter in the interior, but its being of a homogeneous structure. They are also pale, transparent, and of a slightly reddish tint, and have their surface studded, here and there, with small bodies of a round or oval form.

"Structure of the Ganglia. They are of a reddish-gray colour, and composed of two coats or tunics, in the interior of which are found globules, nervous fibres, and blood-vessels.

"*The Tunics* are distinguished into an external, composed of condensed cellular tissue, and an internal, more delicate than the preceding, which sends off processes from its inner surface into the substance of the ganglion.

"*The Globules* are small bodies, nearly spherical in form, and having caudal or tail-like processes. Delicate fibres extend between them and connect them. The greater number of anatomists consider them identical with the cineritious substance of the cerebro-spinal axis.

"*The Nervous Fibres* found in the ganglia may be arranged into the sensific, motific, and organic. The arrangement of these in the ganglia is most intricate, and is consequently made out with much difficulty. The sensific and motific fibres, which have been already mentioned to be derived from the cerebro-spinal axis, and which, in the ganglionic nerves, run parallel to, and are in apposition with one another, in the ganglia separate from each other, repeatedly unite and again separate, and thus form a most complicated net-work or plexus, the intervals of which are occupied chiefly by the globules. With the exception, then, of their separation, the sensific and motific fibres undergo no change in the ganglia; they are not increased in size in passing through them, and they have no further connexion with the globules than merely running between them. The organic fibres on the other hand, are said to commence in the ganglia, in which they arise from the caudal processes of the globules; when such fibres then traverse the ganglia, they are frequently increased in size by the addition of new fibres derived from the globules." P. 804.

We regret that our space does not enable us to insert the excellent remarks of Dr. Lizars on "the functions of the ganglionic system;" they are, however, well worthy of perusal.

The work is brought to a conclusion by a description of the reproductive organs, in which the latest researches are introduced. Those of our readers who are acquainted with the writings of Baer, Purkinje, W. Jones, R. Wagner, Barry, and others, will recognise the accuracy of the subjoined account of the mammiferous ovarium ovum:—

"The Ova, ovula, or vesicles of Baer, by all of which names they are known, are the germs from which the embryo or offspring are produced. It has been said that they are suspended in the Graafian vesicles by retinacula; in the smaller vesicles they are placed nearly in the centre, but in those which are fully formed, they are situated close to the inner surface or epithelium. Each is of a spherical shape, is about $\frac{1}{10}$ of a line, and presents the following parts: First, the exterior is covered with a dense layer of granules, which form what is termed the *tunica granulosa;* these granules are similar to those contained in the fluid of the Graafian vesicle, and those which enter into the formation of the membrana granulosa of that body, and the retinacula. Secondly, within the tunica granulosa is another thick tunic, named the *zona pellucida;* it is composed of an albuminous mass, enclosed in a membrane of extreme tenuity; it is transparent, and when seen under the microscope exhibits the appearance of a bright ring. Thirdly, contained in the zona pellucida is a mass termed the *yolk,* consisting of granules or cells and fat globules. Fourthly, lodged at first in the middle, but afterwards on one side of the yolk, is a minute body, to which the name of *germinal vesicle,* or germinal vesicle of Purkinje, has been given; its diameter is about $\frac{1}{60}$th of a line; and its contents

are transparent, except at one point. Finally, and lastly, within the germinal vesicle and close to its surface, is an opaque spot, whose diameter is only about $\frac{1}{200}$ or $\frac{1}{300}$ of a line: this is termed the *germinal spot*, or germinal spot of Wagner. The germinal vesicle and spot form the essential parts of the ovum; it is at the latter that the development of the embryo commences. These parts of the ovum will be impressed upon the memory by arranging them in a tabular form." P. 895.

The extracts we have given will enable our readers to judge of the general scope and execution of the "Text-Book," which we can with much satisfaction recommend to those for whose assistance it is more especially designed, feeling assured that the student will here find, in addition to the ordinary contents of works of this class, a large number of important facts relating to the higher branches of anatomical science.

I. The Pharmacopœia of the Royal College of Physicians of Edinburgh. 12mo. pp. 217. Edinburgh, 1839.

The Second Edition of the above, 1841.

II. A Dispensatory, or, Commentary on the Pharmacopœias of Great Britain, &c., &c. By *Robert Christison*, M.D., F.R.S.E., Professor of Materia Medica in the University of Edinburgh, Vice President of the College of Physicians, &c. 8vo. pp. 978. Edinburgh, 1842.

III. The London Dispensatory, &c., &c. By *Anthony Todd Thomson*, M.D., F.L.S., Professor of Materia Medica, Therapeutics, and Medical Jurisprudence in University College, London, Fellow of the Royal College of Physicians in London, &c., &c. 8vo. pp. 1317. London, 1844.

[Continued from page 2[illegible].]

Without further preface we continue our examination of the Edinburgh Pharmacopœia, and of Dr. Christison's and Dr. Thomson's Dispensatories.

Ferri Sulphuretum.—The following are the directions of the Edinburgh College for preparing this compound:—

"Ferri Sulphuretum.

The best Sulphuret of Iron is made by heating an iron rod to a full-white heat in a forge, and rubbing it with a roll of sulphur over a deep vessel filled with water to receive the fused globules of sulphuret which form. An inferior sort, good enough however for Pharmaceutic purposes, is obtained by heating one part of sublimed sulphur and three of iron-filings in a crucible in a common fire till the mixture begins to glow, and then removing the crucible and covering it, until the action, which at first increases considerably, shall come to an end."

The process of the Dublin Pharmacopœia, is as follows:—

"Let an iron rod be heated to whiteness in a very strong fire, urged by bellows, and being immediately removed from the fire, let it be applied to a solid mass of sulphur. Let the Sulphuret of iron received in water be separated from the Sulphur, then dried and kept in close vessels."

These processes are mixed and metamorphosed by Dr. Christison in the following manner:—

"FERRI SULPHURETUM, *E. D.* *Protosulphuret of Iron: Sulphuret of Iron.*

PROCESS, *Edin.* Take of
Iron-filings, three parts;
Sublimed sulphur, one part.
Mix them thoroughly; heat the mixture in a covered crucible till it become red hot; remove the crucible from the fire and allow the action to go on without heat.

PROCESS, *Edin. Dub.* A purer sulphuret may be obtained by heating an iron rod to a white heat in a blacksmith's forge, applying a stick of sulphur to the end of the rod, and collecting in water the fused globules which fall down. These should be freed of sulphur and kept in a close vessel."

Dr. Christison observes, that the Sulphuret which is prepared from iron-filings by one of the Edinburgh processes, contains an excess of iron; this excess is indeed so obviously great that it is singular it should have been directed to be employed. Protosulphuret of iron consists of one equiv. of sulphur 16 + one equiv. of iron 28, and supposing no sulphur to be sublimed or burnt in the operation, the result of it must consist of 44 parts of sulphuret and 20 of iron; so that when 16 of sulphur are heated with 48 of iron, the mass must consist of 44 parts of sulphuret mixed with 20 parts of iron; and when 64 grains are acted upon by dilute sulphuric acid, the gas obtained is a mixture of about 46 cubic inches of sulphuretted hydrogen, and 33 cubic inches of mere hydrogen.

It is indeed true that the hydrogen does no absolute mischief, but the escape of this gas, especially when mixed with sulphuretted hydrogen, is always disagreeable; added to which, about four-tenths of the sulphuric acid employed in liberating this mixture of gases is wasted.

Dr. Thomson has entirely omitted the Dublin process; with respect to the Edinburgh formulas, he says, "the result of the first contains an excess of iron: it is only by the first process, carefully executed, that a pure sulphuret is obtained." We need hardly observe that the remark should have been, that the result of the first process contains *no* excess of iron; it is the second which does so.

Ferrugo is the preparation which we shall next notice. The directions for obtaining this substance, which we find in the index is translated Rust of Iron, is thus given in the Edinburgh Pharmacopœia.

"FERRUGO.

Take of Sulphate of iron, four ounces:
Sulphuric Acid (commercial) three fluidrachms and a-half.
Nitric Acid (D. 1830), nine fluidrachms;
Stronger Aqua Ammoniæ three fluidounces and a-half.
Water, two pints;

Dissolve the sulphate in the water, add the Sulphuric acid, and boil the solution; add then the Nitric acid in small portions, boiling the liquid for a minute or two after each addition, until it acquires a yellowish-brown colour and yields

a precipitate of the same colour with ammonia. Filter; allow the liquid to cool; and add in a full stream the Aqua Ammoniæ, stirring the mixture briskly. Collect the precipitate on a calico-filter; wash it with water till the washings cease to precipitate with nitrate of baryta; squeeze out the water as much as possible; and dry the precipitate at a temperature not exceeding 180°.

"When this preparation is kept as an antidote for poisoning with arsenic, it is preferable to preserve it in the moist state, after being simply squeezed."

Dr. Christison, in his Dispensatory, has accidentally substituted three *fluidounces* and a-half of sulphuric acid for three *fluidrachms* and a-half. It will be remembered that, in preparing the Ferri oxidum nigrum, the protoxide of half of the sulphate of iron is converted into sesquioxide by means of nitric acid; and for this purpose, on that occasion, the College direct pure nitric acid of sp. gr. 1·5 to be employed, while in Ferrugo, they order commercial nitric acid of sp. gr. 1·380 to be used for a similar purpose; for this diversity of practice we can discover no reason; the commercial acid is the more economical, and why it should not have been used in both preparations we are at a loss to conjecture.

We attempted to prepare this medicine in the mode ordered, adding the nitric acid a fluidrachm at a time to the solution of sulphate of iron, and heating it after each addition; we found, however, on employing the test recommended by the College, of the colour of the precipitate yielded by ammonia, that the whole of the protoxide of iron was not converted into sesquioxide until the boiling had been so long continued as that scarcely 16 fluidounces of solution remained, consequently 24 fluidounces of water were evaporated; as the solution was evidently much too concentrated to be conveniently decomposed, water was added to it to make it up to two pints, or the original measure; on mixing ammonia with a small portion of this diluted solution in a test tube, so gelatinous a precipitate of sesquioxide of iron was formed, that on inverting the tube scarcely a drop of liquid left it.

The quantity of the solution was then, by the addition of water, increased to four pints, and even then the precipitate given by the ammonia was so bulky, that scarcely two pints of clear liquor could be poured off from it, after allowing eighteen hours for the subsidence of the oxide of iron.

It is, we think, quite evident, that if any one had attempted to prepare Ferrugo according to the directions of the Pharmacopœia, they never would have found a place in it; as to the employment of the stronger instead of the weaker solution of ammonia, we refer to what we have said under the head of Ferri oxidum nigrum.

There are some inconsistencies in the College directions for preparing the three precipitated oxides of iron, which we shall point out. Under Ferri oxidum nigrum the ammonia is to be "immediately" added in a full stream to the mixed and hot solutions of protoxide and peroxide of iron, whereas in Ferrugo the solution of iron, with evident propriety, is directed to be allowed to cool, before admixture with the ammonia.

With respect to the Ferri Oxidum nigrum, the precipitate is directed to be washed, "till the water is scarcely precipitated by solution of nitrate of baryta;" and the precipitated Ferri oxidum rubrum is to be washed "till the water is but little affected with solution of nitrate of baryta;" whereas,

Ferrugo is to be washed "till the washings cease to precipitate with nitrate of baryta." We need hardly say, that in our opinion, the directions in the last case are unreasonable, for we found that less than 10 drachms of Ferrugo required about four gallons of distilled water to effect the purpose directed.

Dr. Thomson, like Dr. Christison, has given *fluidounces* of sulphuric acid in the formula for Ferrugo instead of *fluidrachms*, and we should suppose that the former had copied the error from the latter, had we not observed the proneness of Dr. Thomson to commit errors of this sort, as shown by his substituting *fluidounces* for *fluidrachms* of nitric acid in the formula for Ferri oxidum nigrum. The directing of fluidounces intead of fluidrachms of sulphuric acid in Ferrugo is not however the only grave error which Dr. Thomson has committed in this formula, for he has entirely omitted the nitric acid, so essential to the process; so that we have eight times the proper quantity of one acid directed to be used, and, as if by way of compensation, the whole quantity of another is omitted.

Alluding to this preparation, Dr. Thomson says, "the salt thus formed has a yellowish-brown colour," meaning, we presume, the *oxide* thus formed; and he further states, "its composition, most probably, when properly prepared, is one part of sesquioxide of iron $= 80+2$ parts of water $= 18$, making the equiv. 98 ($Fe^2. O^5. + 2 H. O.$)"

Now, how "one part" can be considered as $= 80$, or "two parts" as $= 18$, we are at a loss to conjecture, and therefore propose to read one equivalent for one part, and two equivalents for two parts; in the formula, O^5 is misstated for O^3.

Ferri Sulphas.—The Edinburgh formula for this salt is entirely left out of Dr. Christison's Dispensatory; it is as follows in the Pharmacopœia:—

> "Ferri Sulphas.
> If the Sulphate of iron of commerce be not in transparent green crystals, without efflorescence, dissolve it in its own weight of boiling water acidulated with a little sulphuric acid; filter; and set the solution aside to crystallize. Preserve the crystals in well-closed bottles."

Supposing commercial sulphate of iron to contain, as it usually does, some sesquipersulphate, it would dissolve in water, and any subsalt of the peroxide would be dissolved by the sulphuric acid; this process seems therefore calculated to reproduce the impurity which it is intended to remove; whereas, by adding a little iron, the sesquioxide would be reduced to protoxide, and any copper which the commercial salt might contain would be precipitated by it.

Among the "formulas for ascertaining the requisite purity of the more important articles, and their freedom from known adulterations," we find with respect to sulphate of iron, the following in Dr. Christison's Dispensatory:—"Tests. *Edin.* Entirely soluble: its solution precipitated by excess of ammonia, yields on filtration a fluid which is colourless, or very pale blue."

The reader will perhaps scarcely believe that not one word of this statement of the tests is to be found in the Edinburgh Pharmacopœia, yet such is the case, for the tests which it gives are merely the following:—"Pale

bluish-green crystals, with little or no efflorescence." The question then naturally arises, what could induce Dr. Christison to omit the tests of the Pharmacopœia and make this unauthorized substitution for them? To this inquiry we can imagine that only one answer can be given, which is this:—that whereas Dr. Christison has nearly thirty times objected to the tests of the London College, that they are mere proofs of the nature of the substances and not of their purity, it would hardly be consistent in him to suffer a mere statement of colour, and absence of efflorescence to appear in his Dispensatory as proofs of chemical purity.

But this is not all: it appears from Dr. Christison's representation of this Pharmacopœia test, that a pale blue colour, occasioned by the action of excess of ammonia, is a test of purity, whereas it is well known to indicate the presence of copper.

Still further: Dr. Christison observes, that "in stating in the Edinburgh formula, the ammoniacal tests for indicating copper, the preliminary step for converting the oxide of iron into sesqui-oxide, which is quite essential, has not been mentioned." This observation is made up of candour and unfairness; of candour, because the error is unquestionable, and clearly his own; of unfairness, because he attributes it to the College, which, as we have already shown, does not employ this test at all.

When ammonia is added in excess to a solution of protosulphate of iron, the filtered solution becomes turbid by the deposition of peroxide of iron which had been dissolved as protoxide, and attracted oxygen from the air; hence the necessity, as mentioned by Dr. Christison, for converting the protosulphate into persulphate of iron, previously to adding the ammonia.

With respect to the composition of sulphate of iron, we may remark, that Dr. Christison has committed several errors; he says:—"The salt is composed of one equivalent of protoxide of iron, one equivalent of sulphuric acid, and six equivalents of water ($SO^3 + Fe\ O + 6\ HO$,) and consequently of 36 parts of base, 40·1 of acid, and 54 of water. Hence the anhydrous salt of the Edinburgh Pharmacopœia contains about four-fifths more of real sulphate than the crystallized: which must be attended to in prescribing it. As five of the equivalents of water are easily expelled by heat, while a much higher heat is necessary to drive off the fifth, this equivalent is considered by Professor Graham to exist in the salt as a base, so that the constitution of sulphate of iron, according to his view, is $SO^3\ FeO\ HO + 5\ Aq$."

Now Graham's statement does not resemble the above either in form or in fact; his formula (*Elements*, p. 558,) is $Fe\ O,\ SO^3,\ HO + 6\ HO$, showing that it contains not 6, but 7 equivalents of water; if, as stated, the ferri sulphas exsiccatum were anhydrous, (which it is not,) then, even admitting the fact, it would be incorrect to assert that it contains any proportion whatever of itself, and yet Dr. Christison says, that "the anhydrous salt of the Edinburgh Pharmacopœia contains about four-fifths more real sulphate than the crystallized." Now, as 139 of the crystallized salt contain 76 of anhydrous sulphate of iron, 100 will give rather less than 55, instead of 80, as stated by Dr. Christison.

In the above quotation Dr. Christison has mentioned that a higher heat is required to drive off the fifth equivalent of water; this is a mis-print for the *sixth*; but even when thus amended the fact is not correctly stated;

Professor Graham says (Elements, p. 559,) "of the 7 HO which copperas contains, it loses 6 HO at 238°, but retains 1 eq. even at 535°."

We have said that the Ferri sulphas exsiccatum of the Edinburgh Pharmacopœia is not anhydrous, as represented by Dr. Christison; it is directed to be dried at "a moderate heat;" this is not defined in the present Pharmacopœia, but in the former, *calor lenis* meant a temperature of between 90° and 110° of Fahrenheit, and we may, perhaps, consider the terms as synonymous, more especially as in preparing the Unguentum Citrinum the axunge is directed to be melted in the oil, "with the aid of a moderate heat;" now we have, as above quoted, Professor Graham's authority for stating that sulphate of iron retains one equivalent of water, even at 535°.

Dr. Thompson has made some observations on the action of dilute sulphuric acid upon iron in relation to this salt, which we confess we do not comprehend; he observes that, "the rapid decomposition of the diluted acid by the iron must be ascribed to the sum of the affinities of the base of the acid for oxygen, and of the iron for oxygen being superior to that of the oxygen to the hydrogen of the water, which is, therefore, decomposed." Now we do not comprehend how the affinity of sulphur, which is the base of the acid, for oxygen, can play any part whatever in this operation.

Like Dr. Christison, Dr. Thomson has been very unfortunate in his statements respecting the water contained in sulphate of iron; he says, "Mr. Phillips makes the proportions to be of acid 28·8, protoxide of iron 25·9, and water 45·3, or 1 eq. of acid = 40·1 + 1 of protoxide of iron = 36 + 6 eq. of water = 54; making the equiv. of the salt 130·1 ($Fe.\ \dddot{S}. + 6\ \dot{H}.$)" Now Mr. Phillips states distinctly that the salt contains 7 equivalents of water = 63, and he gives its formula $FeO, SO^3, 7\,HO$, instead of that above represented by Dr. Thomson, who then goes on to say, "but, according to Prof. Graham, who regards 1 equivalent of the water to exist as a base, it contains only 5 eq. of water;" to this we will only add that the quotation which we have given from Prof. Graham, shows that this salt contains 7 equivalents of water.

Ferrum Tartarizatum.—It has been shown that Dr. Christison has very unceremoniously dismissed the Edinburgh College tests of the purity of Ferri Sulphas, and substituted his own for them: it will, therefore, excite no surprise that he should exercise the same discretion, or the same want of it, with regard to the tests of the London College; these are thus stated with regard to *Ferri Potassio-tartras:*—"In aquâ tota liquatur. Hic liquor lacmi et curcumæ colorem non mutat. Nec a potassii ferrocyanido cæruleum fit; neque adjecto quovis alkali aut acido quicquid dejicitur. Magnes in ejus pulverem nullam vim exercet." The following is Dr. Christison's version of these statements: "Entirely soluble; without action on litmus; unaffected by ferrocyanide of potassium, acids, or alkalis: not attracted by the magnet." The reader will observe, that "*in water*" is omitted after "*entirely soluble,*" *solution* before *litmus*, and *turmeric* after it; *colorem non mutat, nec cæruleum fit*, and *neque quicquid dejicitur*, are translated *unaffected*. It may indeed be admitted that the

meaning of the London College has in general been preserved, but to this there is one exception; the fact being that acids *do* affect this preparation, though, as correctly stated by the London College, they do not precipitate anything from it, yet they decompose it, for if hydrochloric or sulphuric acid be added to it, ferrocyanide of potassium, will then occasion the immediate formation of Prussian blue.

Dr. Christison remarks that chemists generally assume 80 as the true number for sesquioxide of Iron; there are, however, exceptions to this, for Brande, Daniell, Henry, Murray, and Thomson, give 40 as the equivalent of this oxide. Dr. Christison quotes Wackenroder to prove that Ferrum tartarizatum contains both protoxide and sesquioxide of iron, and that when it is decomposed by heating with potash, black oxide of iron is separated; this is certainly an error, not only in our experience, but as proved by Soubeiran and Capitain (Journ. de Pharm., 25, 138;) partial deoxidizement of the sesquioxide occurs only when the heat applied to the preparation has been too great.

Dr. Thomson has in his worst manner made woful work with the London formula for this preparation; instead of three ounces of sesquioxide of iron as directed, he says twelve ounces and a half, for eleven ounces and a half of bitartrate of potash he mentions three, and three hours digestion are stated instead of two.

Corrosivus Sublimatus.—The tests of the Edinburgh College for ascertaining the purity of this preparation are, "it sublimes entirely by heat; and its powder is entirely and easily soluble in sulphuric ether;" but as we are informed by the same College with respect to camphor, that "its powder evaporates entirely when gently heated," and as Dr. Christison states, that "sulphuric ether is a good solvent of camphor," allow us to enquire wherein these substances differ?

Dr. Christison, in the Edinburgh process, has directed *sulphuric acid* instead of *commercial* sulphuric acid, to be employed, and *nitric acid* instead of *pure* nitric acid; and Dr. Thomson has ordered half a *fluidrachm* of the last mentioned acid to be used in the place of half a *fluidounce*. He also states that this salt has an *alkaline* re-action, meaning we presume an *acid* one, for it reddens litmus paper and does not alter turmeric. With respect to the crystalline form of this salt Dr. Christison states that "it is a quadrangular prism terminated by two converging planes," while Dr. Thomson describes it as a "regular tetrahedron, compressed and pointed."

Unguentum Citrinum.—The following is the formula for preparing this ointment in both editions of the Edinburgh Pharmacopœia:—

"UNGUENTUM CITRINUM.

Take of Pure Nitric acid, eight fluidounces and six fluidrachms;
Mercury, four ounces;
Axunge, fifteen ounces;
Olive-oil, thirty two fluidounces.

Dissolve the mercury in the acid with the aid of a gentle heat. Melt the axunge in the oil with the aid of a moderate heat in a vessel capable of holding six times the quantity; and while the mixture is hot, add the solution of mercury, also hot,

and mix them thoroughly. If the mixture do not froth up, increase the heat a little till this take place. Keep this ointment in earthen-ware vessels, or in glass vessels secluded from the light."

It has been discovered by Dr. Christison, as he states in a note p. 530 of his Dispensatory, that, "owing to an accidental error, the proportion of olive-oil has been stated in the Pharmacopœia at 32 fluidounces, and the pure nitric acid of density 1500 has been ordered." The mistake here alluded to is afterwards explained by Dr. Christison to have arisen as follows: "An oversight has been committed in the College formula from an error made by Dr. Duncan. The proportions used by Messrs. Duncan and Flockhart are twelve ounces of nitric acid of the density 1380 to 1390, four ounces of mercury, fifteen ounces of axunge, and thirty-two ounces of olive-oil,—all taken by avoirdupois weight and none by measure;" and, adds Dr. Christison, "I have corrected the College formula accordingly." And we accordingly find the following formulà substituted in the Dispensatory for that of the Pharmacopœia:—

UNGUENTUM CITRINUM.

Take of Nitric acid (Dens. 1380 to 1390) nine fluidounces and a half;
Mercury, four ounces;
Axunge, fifteen ounces;
Olive-oil, thirty-eight fluidounces and a half;
Dissolve the Mercury, &c., &c.

It certainly is a remarkable fact that the errors here rectified should have appeared in two editions of the Edinburgh Pharmacopœia. Dr. Christison, after alluding to the proper temperature for mixing the ingredients, and the use of almond and rape-oil and butter, as substitutes for olive-oil, proceeds to say, "the other Colleges still follow the *old faulty system*;" and the following will show how erroneous their proportions must be if Mr. Duncan be correct:—

	Nitric Acid, D. 1500.	Mercury.	Oil and Lard.
Edin.	6·5 fluidounces.	4 ounces, Tr.	47 ounces by weight.
Lond.	5·50 . . .	4 . . .	40 . . .
Dub.	3·83 . . .	4 . . .	80 . . .

In this attempt to exhibit the proportions of other ingredients employed by the different Colleges with a standard quantity of mercury, the first assumption is, that nine fluidounces and a half of nitric acid of specific gravity 1390, are equivalent in strength to six fluidounces and a half of sp. gr. 1500; now these six fluidounces and a half weigh 4265 grains, of which four-fifths are real acid = 3412 grains; nine fluidounces and a half of acid of sp. gr. 1390 weigh 5777 grains, containing 54·6 per cent. of real acid = 3153 grains; but if 3412 grains of real acid are equal to six fluidounces and a half of nitric acid of 1500, 3154 grains = 6 fluidounces only, instead of 6·5 as stated in the table.

The proportion of acid of the London Pharmacopœia is correctly stated, but not so the weight of the oil and lard; an imperial fluidounce of olive-oil weighs about 402 grains, 16 fluidounces will consequently weigh 13·4 troy ounces, and these added to 24 troy ounces of lard will give only 37·4 ounces as the weight of these two ingredients, instead of 40, as

given in the table. This error appears to have arisen from considering 16 fluidounces of oil as equal to 16 troy ounces, for, added to the [illegible] ounces of lard, they make the stated quantity of 40 ounces.

With respect to the Dublin formula, five ounces and three quarters of nitric acid of sp. gr. 1490 are used with four ounces of mercury, four wine pints of oil, and sixteen ounces of lard. Nitric acid of 1490 contains 76·5 per cent. of real, and five ounces, six drachms = 2760 grains, therefore contain 2111 grains of real acid, which are equal to four fluidounces instead of only 3·83 as stated in the table. Taking the sp. gr. of olive-oil at 0·919, four wine pints or 64 wine fluidounces, will weigh 55·8 ounces troy, which added to 16 ounces of lard, will give 71·8 as their combined weight instead of 80 ounces.

The statement therefore exhibited by Dr. Christison, to prove "how erroneous" the other Colleges are, if his amendment of the Edinburgh and "Mr. Duncan be correct," should be altered as follows :—

Edin.	6· fluidounces	4 ounces T.	47 ounces by weight.
Lond.	5·50 . . .	4 . . .	37·4 . . .
Dub.	4·00 . . .	4 . . .	71·8 . . .

Morphia.—With respect to the composition of this alkali Dr. Christison remarks that, "the analysis most confided in, that of Liebig, represents the anhydrous alkaloid to consist of 71·36 per cent. of carbon, 17·47 oxygen, 6·56 hydrogen, and 4·61 azote ; which proportions approach nearly to the following constitution in chemical equivalents—C^{34} [illegible] H^6 N = 372·08." Now it will appear by calculation, which it is not requisite to give, that the above-mentioned composition, instead of approaching that represented by the formula stated, would be more correctly denoted by C^{36}, O^7, H^{20} N, while C^{34} O^{18} H^6 N represents 55·92 per cent. carbon, 38·70 of oxygen, 1·62 of hydrogen, and 3·76 of azote, instead of the composition stated by Dr. Christison ; but in accordance with the incorrect formula the equivalent of morphia is stated by Dr. C. to be = 372·08.

On referring to Dr. Christison's statement of the composition of acetate of morphia, it would seem as if the figures representing the equivalents of oxygen and hydrogen had accidentally changed places in the formula which we have quoted; for he says that acetate of morphia "is probably composed of one equivalent of base, of acid, and of water (C^{34} H^{18} O^6 N + $\bar{A}$ + Aq.) that is, 372·08 parts of morphia, 43·28 acetic acid, and 9 water."

In the formula already given, we have O^{18} H^6, and on referring to Liebig and halving the equivalents for hydrogen and azote, he gives C^{35} H^{20} O^6 N, to which Dr. Christison's amended formula somewhat approximates ; but then he has again given 372·08 as the equivalent, whereas it should be 288·08 ; it may be farther observed that, the equivalent of acetic acid is given as 43·28, instead of 51·48, which is shown at p. 8 of the Dispensatory to be its equivalent.

Under the head of Muriate of Morphia Dr. Christison has also given the more correct formula for morphia ; and he states that, "the constitution of the muriate of morphia is supposed to be one equivalent of the base, one of its acid, and six of water (C^{34} H^{18} O^6 N + HCl + 6 Aq.) or

76·24, 9·66 and 14·1 per cent." Now this composition does not agree with the first, but with the second or more correct equivalent of morphia.

Dr. Thomson has also been most unfortunate in his statements respecting the composition of morphia, and has contributed his full quota towards the propagation of error; he makes the following statement: "Morphia consists of 1 eq. of anhydrous morphia = 288·23 + 2 eq. of water = 18, making the equivalent = 306·41. The anhydrous salt [alkali] consists of—

34 eq. of carbon	= 208·08,	or 71·36	per cent.
16 — hydrogen	= 16·	— 6·56	"
18 — oxygen	= 144·	— 17·47	"
1 — nitrogen	= 14·15	— 4·61	"
Equiv.	= 372·23	100·00."	

The statement that morphia consists of itself and two equivalents of water, means, we presume, that the crystals of morphia are so constituted.

The account of the number of equivalents contained in morphia, was we suppose, intended to be a copy of Dr. Christison's very incorrect representation, in which, as we have already pointed out, the equivalents of oxygen and hydrogen have changed places; but in addition Dr. Thomson has slipped in ten equivalents of hydrogen, and yet finds that the equivalent is only 372·23 instead of 382·23; and, notwithstanding the addition of these ten equivalents of hydrogen, we find the same erroneous representation of the composition of 100 parts of morphia as given by Dr. Christison. It is indeed impossible not to perceive the errors of the above statements on the slightest glance; thus, the oxygen *is to the* nitrogen, in the above statement, as 144 to 14·15, or about 10 *to 1*; *but* in 100 parts they are given as 17·47 to 4·61 or nearly as 4 to 1.

We shall not fatigue the reader with a statement of what the composition of 100 parts of morphia is according to Dr. Thomson's incorrect representation of its atomic constitution, but merely remark that as 71·36 per cent. of carbon should be 55·9, corresponding alterations would require to be made in the quantities of the other constituents; but it would be a waste of time to correct a part when the whole is so completely erroneous.

With respect to the acetate of morphia, Dr. Thomson continues the error which he has committed, he says "acetate of morphia is a compound of 1 eq. of morphia = 372·23 + 1 acetic acid = 51·48 + 1 water = 9, making the equiv. = 432·91, or 82·95 parts of morphia + 14·15 of acetic acid and 2·55 of water = 100 parts of the salt." Adopting 372·23 as the equivalent of morphia, and 51·48 as that for acetic acid, and 9 = 1 equivalent of water, the equiv. of acetate of morphia will be 432·71, and 100 parts of it will consist of 86·02 morphia, 11·89 acid, and 2·09 water, instead of the quantities stated by Dr. Thomson.

Similar errors occur with respect to hydrochlorate of morphia. "The crystals consist of one eq. of morphia = 372·23 + 1 of hydrochloric acid = 36·42, and 6 of water = 54, making the equiv. 462·65, or 76·24 parts morphia + 9·66 acid, and 14·10 water, = 100 parts." Now, admitting as before the incorrect equivalent for morphia, 100 parts of the hydrochlorate must consist of 80·45 morphia, 7·87 acid, and 11·68 water,

instead of the quantities above stated. We may observe that Dr. T.'s statement is apparently taken from Dr. Christison, and he has adopted it without appearing to know that his equivalent of morphia differs as widely from that of Dr. Christison as 372·23 from 288·08.

Plumbi Acetas.—In preparing this salt, the Edinburgh College have directed fourteen ounces of litharge to be dissolved in two pints of pyroligneous acid of sp. gr. 1034, and one pint of water; it is stated that 100 minims of this acid saturate 53 grains of carbonate of soda; now two pints of 40 fluidounces are equal to 19,200 minims, and consequently are capable of saturating 10,176 grains of the alkaline carbonate, equivalent to 7914 grs. of litharge, or nearly 16·5 ounces; and this is the quantity which should have been ordered instead of only 14; it therefore follows that a considerable portion of the acid must remain unsaturated with the oxide of lead.

It is stated by Dr. Christison, that when crystallized acetate of lead is heated to 320°, it loses the whole of its water, and it might be supposed that this high temperature was requisite to produce the effect; we have found however, by repeated experiments, that this salt is rendered perfectly anhydrous by exposure to the heat of steam in a porcelain vessel, and consequently even below 212°. It is further mentioned that "thirty grains of phosphate of soda and 47·66 of acetate of lead exactly decompose one another. Hence, if 48 grains or a 144th part more of the latter salt be used, the solution will be affected after filtration by a farther addition of phosphate, provided the acetate be tolerably pure." Now the difference between 48 and 47·66 is 0·34, which is almost exactly 1-140th of, instead of 1-144th of, 47·66; this we are aware is minute criticism, but any statement worth making is worth correcting.

Plumbi Nitras.—In treating of this salt Dr. Christison observes that, "Nitrate of Lead is obtained according to the process of the Edinburgh College by dissolving lead with the aid of heat in dilute nitric acid, and crystallizing the solution by evaporation and cooling. It may be prepared equally well by dissolving letharge in the acid." It is quite evident that Dr. Christison had forgotton that the Edinburgh process, which consisted in dissolving lead in nitric acid, had been abandoned; for he could not be ignorant that the use of litharge, which he represents as equally efficient, had actually been preferred, on account of its being more so.

The following were the directions contained in the first edition of the Edinburgh Pharmacopœia for preparing—

"PLUMBI NITRAS.
Take of Lead, six ounces;
Diluted Nitric Acid, six fluidounces;
Water, six fluidounces;
Mix the acid and water, and dissolve the lead with the aid of a gentle heat
Concentrate the solution, and set it aside to cool and crystallize."

It having been shown that this formula was in every respect objectionable, that to want of economy there were added improper and impracticable proportions of the several ingredients, the Edinburgh College rejected

it, and the following directions are now substituted for it in the new edition:—

"Take of Litharge, four ounces and a half;
Diluted Nitric Acid, a pint;
Dissolve the litharge to saturation with the aid of a gentle heat. Filter and set the liquid aside to crystallize. Concentrate the residual liquid to obtain more crystals."

Now, if we calculate rightly, it will be impossible to saturate the acid with employing the assigned portion of litharge. The sp. gr. of the dilute nitric acid is by our experiment 1·080, a pint, or 20 fluidounces, will therefore weigh 9450 grains, and contains about 1096 grains of real acid, requiring 2273 of oxid of lead for saturation, instead of only 4½ ounces, or 2160 grains directed for that purpose, so that about 1-20th of the acid must remain unsaturated; even with this imperfection, however, the process is a great improvement on the rejected one, though, as already pointed out, forgetfulness has occasioned Dr. Christison to represent the former process as still continued, and the use of litharge merely as good as that of lead, but not as an improvement actually adopted.

Potassæ Acetas.—This salt is directed to be prepared as follows:—

"Take of Pyroligneous acid, a pint and a-half;
Carbonate of potash (dry,) seven ounces, or a sufficiency;
Add the carbonate gradually to the acid till complete neutralization is accomplished. Evaporate the solution over the vapour-bath till it is so concentrated as to form a concrete mass when cold. Allow it to cool and crystallize in a solid cake; which must be broken up and immediately put into well-closed bottles."

The Materia Medica of the Edinburgh College contains *Potassæ Carbonas*, obtained by purifying pearlash, and among the preparations there is *Potassæ Carbonas purum*; it is stated that the former should not lose more than one-fifth of its weight, and the latter not any at a red heat. Now *dry* may mean *anhydrous*, or merely *not moist*; on the first supposition we shall examine into the sufficiency of the Potassæ Carbonas purum ordered in the first instance for the saturation of a pint and a half or 30 fluidounces of pyroligneous acid.

We have shown under *Plumbi Acetas* that 40 fluidounces of pyroligneous acid must, according to the College, saturate 10,176 grains of carbonate of soda, equivalent to 4946 grains of anhydrous carbonate of potash, 30 fluidounces will therefore require 3710 of this salt for the same purpose; the College have, however, ordered only 3360 grains, or nearly 6 drachms less than the requisite quantity.

If, however, *dry* mean merely *not moist*, the operator may then employ *Potassæ carbonas* containing 20 per cent. of water, and in this case he will require 4637 grains or rather more than 9 ounces and 5 drachms, instead of the 7 ounces indicated. This ambiguity would have been avoided by omitting the word *dry*, or employing the term *pure*.

With respect to the solubility of this salt, Dr. Thomson states that "one fluidounce of distilled water at 60° dissolves 504 grains; or 100 parts of it are soluble in 102 parts of water." Now, if 504 grains require a fluidounce or 437·5 grains of water for solution, 100 will be dis-

solved by 86·8 grains, instead of 102. Dr. Thomson proposes to detect the presence of tartrate of potash in this salt by adding to a solution one of acidulated acetate of lead, in which case, he says, a precipitate will fall soluble in acetic acid. Tartrate of lead is not, however, very readily soluble in this acid, and it would be better to employ the nitric, which immediately takes it up; indeed, the use of acidulated acetate of lead shows that the tartrate is not easily dissolved by acetic acid. Again Dr. Thomson says that the hydrochlorates are detected by nitrate of silver, but in the employment of this test the solution must be considerably diluted, otherwise a crystalline precipitate of acetate of silver is formed, which, however, is rapidly distinguishable from the chloride by its solubility in a large quantity of water or a small portion of nitric acid.

Potassæ Aqua.—In preparing this solution the Edinburgh College have directed the use of *dry* carbonate of potash, which, as we have before remarked, may mean either the anhydrous salt, or that containing 20 per cent. of water, and this ambiguity may cause considerable variation in the strength of the preparation.

Dr. Christison has thus given the directions of the London Pharmacopœia for mixing the various ingredients employed in this solution:—"Let the lime be slaked with a little of the water in an earthen vessel: add the rest of the water; transfer the mixture immediately into a close vessel, &c., &c." It so happens that the directions for employing the carbonate of potash are entirely omitted; in the original they commence with "dissolve the carbonate of potash in half a gallon of the water," and then follow "let the lime be slaked with a little water, &c."

With respect to the Liquor Potassæ of the London Pharmacopœia Dr. Thomson remarks, that "one pint of the solution should weigh sixteen ounces; or the specific gravity be 1·063; and it should contain 4·7 per cent. of pure potassa." A pint of water weighs 18 oz. 1 dr. 50 grains, and consequently a pint of a liquid, the density of which is 1063, must weigh 19 oz. 3 drachms, instead of only 16 oz. as stated. The statement is also improbable on mere inspection, that a liquid whose density is 1063 should contain only 4·7 per cent. of solid matter in solution. By calculation we find that the liquor potassæ must contain rather more than 5·9 per cent. of potash, and this calculation is confirmed by that of the quantity required and employed, in precipitating a given quantity of bichloride of mercury in preparing the Hydrargyri Binoxydum.

Potassæ Carbonas.—The Edinburgh Pharmacopœia of 1817, contained Potassæ Subcarbonas and Potassæ Carbonas, and so also does the present; but the College, "seduced by the philosophical attractions of modern Chemical nomenclature," (*Preface, p.* xiii,) have now bestowed, on these preparations their correct appellations, and on this subject Dr. Christison remarks, that "great care must be taken not to confound the Carbonate of the new Edinburgh Pharmacopœia with the Carbonate of the last Latin edition, the former salt being a corrosive poison, and the latter the bicarbonate, which is not poisonous."

It appears to us that the College might, by prefixing *sub* to one carbonate, and *super* to the other, have avoided the danger described by Dr.

Christison; and this method might have diminished the chances of poisoning, without any very material addition to the acknowledged "patch-work" of their nomenclature, which on various occasions they have needlessly increased.

The Edinburgh Pharmacopœia contains Potassæ Carbonas and Potassæ Carbonas purum; the first of these is an article of the Materia Medica. and stated to be obtained by "lixiviating, evaporating, and granulating by fusion and refrigeration the potashes of commerce;" this is explained to be "carbonate of potash not quite pure."

Among the preparations is the following formula for obtaining

"Potassæ carbonas purum.

Pure Carbonate of potash may be most readily obtained by heating crystallized Bicarbonate of potash to redness in a crucible, but more cheaply by dissolving Bitartrate of potash in thirty parts of boiling water, separating and washing the crystals which form on cooling, heating these in a loosely-covered crucible to redness so long as fumes are discharged, breaking down the mass, and roasting it in an open crucible for two hours, with occasional stirring, lixiviating the product with distilled water, filtering the solution thus obtained, evaporating the solution to dryness, granulating the salt towards the close by brisk agitation, and heating the granular salt nearly to redness. The product of either process must be kept in well closed vessels."

The Edinburgh Pharmacopœia does not contain *crystallized* bicarbonate of potash; the directions for preparing it being to "continue the desiccation till a fine powder be obtained; and moreover, among the tests of bitartrate of potash, we find it stated that it is "soluble in 40 parts of boiling water," we must therefore conclude that 30, here directed for the same purpose, will not be sufficient to effect it.

Dr. Thomson, in giving the Dublin formula for preparing Potassæ Carbonas e lixivo cinere, has omitted the words "in vase argenti vel ferri mundissimo."

Potassæ et Sodæ Tartras.—The London College calls this salt Sodæ potassio-tartras, a name for his objections to which Dr. Christison refers to his remarks respecting antimonii potassio-tartras; and we refer to the same article for our reply to his observations.

As to the constitution of this salt, Dr. Christison says, "it is composed of one equivalent of tartrate of potash, one equivalent of tartrate of soda, and ten equivalents of water ($2\bar{T} + KO + Na\,O + 8$ Aq.;) and therefore of 132·96 parts of acid, 47·15 of potash, 31·3 of soda, and 90 of water."

It will be observed that, in his *symbolic* statement, Dr. Christison gives 8 equivs. of water to this salt, while in his *verbal* one, he assigns 10 eqs. to it; we presume that the former, which we believe to be the correct one, was intended, for if the latter be right, then only 40·3 of nitrate of lead would be required to decompose 37 parts of this salt, whereas, we find by the Edinburgh tests, that "37 grains in solution are not entirely precipitated by 43 grains of nitrate of lead;" by calculation, the exact quantity of the salt of lead required appears to be 43·24 grains.

Dr. Christison has very justly criticised the mode adopted by the London College of applying the tests for detecting sulphates and chlorides, in

this preparation. It ought, certainly, to have been stated that the solution of the salt should be largely diluted before adding the nitrate of silver or chloride of barium, or that the precipitates obtained by them are soluble in water and in dilute nitric acid. Under potassæ tartras the London College have directed the latter precaution to be adopted.

With respect to the composition of this salt Dr. Thomson makes the following statements:—"the constituents of 100 parts of this salt, according to Schulze, are 41·3 of tartaric acid, 14·3 of pottassa, 13·3 of soda, and 31·1 of water; according to Vauquelin they are, tartrate of potassa 54 parts, tartrate of soda 46 parts; and according to Mr. Phillips, 40 parts of tartrate of potassa, 34·5 of tartrate of soda, and 25·5 of water in 100 parts. In equivalents, the crystals contain 1 equiv. of tartrate of potassa = 113·63 + 1 of tartrate of soda = 97·8 + 10 of water = 90, making the equiv. 292·43." In his "table of Pharmaceutical equivalents" Dr. Thomson gives as the composition of this salt, "1 soda = 31·3, 1 potassa = 47·15, 2 tartaric acid = 132·96," making the equivalent "211·41." We may first observe, that when 113·63, 97·8, and 90 are added together, they make 301·43, and not 292·43; and, having effected this amendment, let us see, as well as we can make out, how much per cent. of its ingredients this salt must contain, according to the various statements of its composition.

	Schulze.	*In equivalents.*	*Phillips.*	*Table.*	*Vauquelin.*
Tartaric Acid. .	41·3	44·11	46·5	62·89	62·87
Potash	14.3	15·64	16·9	22·30	22·40
Soda	13·3	10·37	11·3	14·91	14·73
Water	31·1	29·88	25·3		
	100·	100·	100·	100·	100·

As it is generally admitted that this salt contains water, it would, we think, have been better if Dr. Thomson had stated on which of the three first analyses, if on any, he placed reliance, and had altogether rejected the two last, which not containing water, cannot represent the salt of the Pharmacopœia. It may be added, that the analysis of Schulze is evidently incorrect, for the equivalent of potash and soda being to each other as 48 to 32, and assuming the proportion of the former to be correctly stated at 14·3, that of the latter must be only 9·54, instead of 13·3.

Potassii Sulphuretum.—We may remark it is a very unusual circumstance, that the three Colleges agree in directing this preparation to be obtained by fusing a mixture of an ounce of sulphur and four ounces of carbonate of potash; as the Edinburgh College do not order the pure carbonate, we must conclude that they mean the less pure preparation, containing, according to their statement, 20 per cent. of water, but which we shall assume to be, like the carbonate of the London College, a sesqui-hydrate, containing 16 per cent. of water.

In the Materia Medica of the Edinburgh Pharmacopœia we find—

> "POTASSII SULPHURETUM. A mixture of sulphate of potash with persulphuret of potassium. *Sulphuret of potash.*"

The error of *sulphuret of potash*, instead of the correct name of sulphuret

of potassium, occurs in both editions of the Pharmacopœia, and is repeated by Dr. Christison in his Dispensatory; even with this correction, the description of this compound is, we think, inaccurate. According to Berzelius, when 94 parts of sulphur are fused with 100 parts of anhydrous carbonate of potash, there are formed 31·5 of sulphate of potash, and 131 of quinto-sulphuret of potassium, the former requiring one-fourth, and the latter three-fourths of the carbonate of potash.

Dr. Christison remarks that the "College proportions amount to nearly the same number of equivalents of carbonate of potash and sulphur." If we divide 480 grains or one ounce of sulphur by 16, it will give 30 equivalents, and 4 ounces or 1920 grains of carbonate of potash, divided by 70, it will give nearly 27·5 equivalents; but this quantity of the alkaline carbonate contains 310 grains of water, which will reduce it to 23 equivalents of anhydrous carbonate, instead of 30. There is, however, a circumstance mentioned by Berzelius, which will certainly diminish the proportion of sulphur as such; he says that, when water is present, hydro-sulphuric acid is formed and expelled with the carbonic acid gas; he does not state what becomes of the oxygen of the decomposed water; it is probable, however, that this also forms an acid with a portion of the sulphur, giving rise to a salt of potash; indeed, according to Winckler, quoted by Dr. Thomson, this is actually the case.

Under these circumstances, all that it seems to be safe to state, with respect to the preparation of the Colleges, is, that it owes its power to quinto-sulphuret of potassium, which is mixed with carbonate, sulphate, and probably other salts of potash; at any rate, it must be admitted, that the College description of its composition, not including carbonate of potash, must be incomplete, for, as already mentioned, Berzelius states that 94 require only 100 of carbonate of potash, to form quinto-sulphuret of potassium and sulphate of potash, whereas the proportions used by the Colleges are 94 of sulphur to 315 of carbonate of potash, considered as anhydrous.

Sodæ Carbonas.—Under this head Dr. Christison has given "a table of the respective proportions of the several acids and alkaline carbonates to be used for effervescing powders." It is as follows:—

	Car. Sod.	*Bic. Sod.*	*Car. Pot.*	*Bic. Pot.*	*Sesq. Amm.*
Tartaric acid 30 grains,	57	38	28	40	24
Citric acid 30 grains,	74	43	36	52	30
Lemon juice 1 fluidoz.	76	45	28	54	32

We assume that the tartaric acid is the crystallized, containing the usual quantity of water, and in that case, 30 grains of it and 57 grains of *crystallized* carbonate of soda, are proper proportions; we believe, however, that both these substances are usually deprived of a portion of water before employment for effervescing powders. Still, admitting the acid to be crystallized, and that Dr. Christison represents bicarbonate of soda by 84·54, the 38 in the table should be 33·6; again—30 grains of crystallized tartaric acid are correctly stated to saturate 28 of carbonate of potash, provided it be the pure or anhydrous preparation of the Edinburgh

Pharmacopœia, which it is not however stated to be; if on the other hand, the less pure preparation be employed, then, as it contains 20 per cent. of water, 35 grains would be required instead of 28; the quantities of bicarbonate of potash and sesquicarbonate of ammonia are correctly assigned.

With respect to Citric Acid, we find that 30 must be anhydrous to saturate as much as 74 of crystallized carbonate of soda; but this acid cannot be obtained free from water; and in its crystalline state, 30 saturate only 61 of carbonate of soda, instead of 74. Again—if the citric acid be anhydrous, then as stated, 30 would saturate 43 of bicarbonate of soda, but the crystals can saturate only 36 instead of 43: always supposing the acid to be anhydrous, it is correctly stated that 30 will saturate 36 of (anhydrous) carbonate of potash, 52 of bicarbonate of potash, and 30 of sesquicarbonate of ammonia.

On merely inspecting the statements of the quantity of the alkaline carbonates required to saturate a fluidounce of lemon-juice, it is evident that all but one must be wrong, and even that we believe not to be right. It will be seen that a fluidounce of lemon-juice is stated to be sufficient to saturate 28 grains of carbonate of potash, we believe 33 to be nearer the quantity; but we will admit, for the moment, that 28 is the right proportion; now this is also the quantity which saturates 30 of tartaric acid, consequently, by the doctrine of equivalents, the lemon-juice should saturate the same quantities of the other carbonates as 30 of tartaric acid; so that supposing the quantities to be correct with regard to tartaric acid, it ought to have been stated that a fluidounce of lemon-juice saturates 57 of carbonate of soda instead of 76, 38 of bicarbonate of soda instead of 45, 40 of bicarbonate of potash instead of 54, and 24 of sesquicarbonate of ammonia instead of 32. In concluding, we recommend a very careful revision of this table.

Sodæ Phosphas.—Dr. Christison explains this salt to be the "triphosphate of Soda and water" of Graham; we have however referred both to his paper on the phosphates (Phil. Trans. 1837) and his Elements of Chemistry, and in neither do we find any mention of such a class of salts as triphosphates; we therefore presume that Dr. Christison means tribasic phosphate of soda and water, which Prof. Graham explains in his Memoir, and also in his Elements, to be the common phosphate of soda, and the formula which Dr. Christison gives is essentially that of this salt adopted by Graham, but the former adds, "it therefore contains 62·6 parts of soda, 71·4 of phosphoric acid, and 216 of water;" the quantity of the last-mentioned constituent is, however, inaccurately stated; it should be 225 of water = 25 equivalents, instead of 216 = only 24 equivalents.

The tests employed by the Edinburgh College for ascertaining the purity of this substance are "an efflorescent salt: 45 grains dissolved in two fluidounces of boiling distilled water, and precipitated by a solution of 50 grains of carbonate of lead in a fluidounce of pyroligneous acid, will remain precipitable by a solution of acetate of lead."

We cannot imagine why a solution of the proper quantity of acetate of lead might not have been adopted instead of the troublesome method of preparing a solution of this salt from acetic acid and carbonate of lead; the acetate is much more likely to be obtained in a state of purity than

the carbonate of lead; the quantity of pyroligneous acid directed for dissolving the carbonate of lead is enormous; we find that 100 minims of this acid saturate 53 grains of carbonate of soda, consequently a fluid-ounce, directed for dissolving 50 grains of carbonate of lead, is sufficient to dissolve 233 grains, or more than four times the quantity required.

It ought to have been mentioned that the precipitate occasioned by acetate of lead is entirely and readily soluble in dilute nitric acid, if unmixed with sulphate; for, not only might a portion of sulphate of lead be precipitated with the phosphate, but there are some sulphates, as ammonia alum, and soda alum, which would fulfil the conditions of precipitating the stated quantity of acetate of lead, and remaining precipitable by the addition of a further quantity.

In the Dublin Pharmacopœia, this salt is directed to be prepared by decomposing 10 *parts* of burnt bone by seven *parts* of sulphuric acid, and Dr. Thomson has correctly so stated it; but, when directing the saturation with soda, he says, "then add three *pounds* and ten *ounces* of carbonate of soda (dissolved in eight parts of warm water.)"

As the *parts* of sulphuric acid and bone may be pounds or ounces, or any larger or smaller weight, at the pleasure of the operator, and as any one selected would require the use of a similar one with respect to the carbonate of soda, we were somewhat surprised at finding a definite quantity of the alkaline salt to be assigned. In endeavouring to clear up the mystery, we referred to the former Dublin Pharmacopœia (1806,) and there found that five *pounds* of bone, three and a half *pounds* of sulphuric acid, and three *pounds* ten *ounces* of carbonate of soda are ordered to be employed. It appears therefore, that, by some very extraordinary mishap, Dr. Thomson has substituted three *pounds* ten *ounces* of the Pharmacopœia of 1806 for the eight *parts* of carbonate of soda of the Pharmacopœia of 1817. It is scarcely requisite to add that, by this unaccountable error, the whole directions are rendered absolutely nugatory.

Referring to the superphosphate of lime produced by the action of the sulphuric acid upon the phosphate of lime, Dr. Thomson says, its separation is ordered to be effected by "digestion in vapour, and the repeated affusions of boiling water;" we confess that we are utterly at a loss to conjecture what is meant by "digestion in vapour."

With respect to the constituents of this salt Dr. Thomson observes, that "Mitscherlich makes them 1 eq. of acid $= 70 \cdot 14 + 1$ of soda $= 31 \cdot 3 + 12$ of water $= 108$: equiv. 209·74;" where this statement is to be found we know not, but in the author's Elemens de Chimie, Vol. 3, p. 63, we find a formula, which certainly does not agree with that cited by Dr. Thomson; it is also stated, and correctly so, that "Professor Graham regards the salt as a compound of 1 eq. of acid + 2 of soda + 1 of basic water, and 24 of water of crystallization," to which it is incorrectly added, "making the equiv. 307·74 ($2\ Na\,O. + H.\,O. + P^2\ O^5 + 24\ H.\,O.$)" for Professor Graham makes the equivalent 359·15, and in his formula we have PO^5, and not $P^2\ O^5$ as above stated.

Among the tests directed to be prepared in the Edinburgh Pharmacopœia, we shall notice only two, and of these the first is Ammoniæ Oxalas; this is directed to be obtained by saturating four ounces of oxalic acid with eight ounces of sesquicarbonate of ammonia; the equivalent of oxalic

acid is 63, and that of the ammoniacal salt 59, considering it as containing one equivalent of alkali; consequently four ounces, or 1920 grains, of the acid require for saturation only 1798 of the 3840 grains, or eight ounces, directed to be used, without any occasional trial of the state of saturation.

On referring to Dr. Christison's Dispensatory, (p. xx.) we think we discover the cause of this mistake, he says "the process for oxalate of ammonia is a case of simple decomposition. Carbonate of ammonia and oxalic acid being brought together in their equivalent proportions." In p. 112, Dr. C. represents the following as the formula for the ammoniacal salt, "$2 H^3 N + 3 CO^2 + 2 HO = 1$ sesquicarbonate of ammonia," and on this view of the subject, and adopting Dr. Christison's equivalents, the number of this salt is 118·66, and consequently in directing 3840 grains, the excess would appear to amount to only about 224 grains. It is therefore evident that the process for preparing oxalate of ammonia was never submitted to experiment, and the erroneous directions for its preparation arose from supposing that the double equivalent of sesquicarbonate of ammonia contained only one instead of two equivalents of the alkali.

We do not speak from theory, it was evident that the experiment would occupy but a few minutes and we made it,—and we found that, when equal weights of oxalic acid and sesquicarbonate of ammonia were mixed with distilled water, the oxalic acid was so perfectly saturated as not to affect litmus paper, but on the contrary, that the solution turned turmeric paper brown, and yielded ammonia when heated, as was perceptible both to the smell and to turmeric paper.

Barytæ Nitras.—The instructions are that, "this salt is to be prepared like the muriate of baryta, substituting pure nitric acid for the muriatic acid." We are therefore to *substitute* half a pint of pure nitric acid of sp. gr. 1·5 for the same quantity of pure muriatic acid of sp. gr. 1·17; thus using the same measure of these very different acids, with the same quantity of carbonate of barytes; half a pint of the muriatic acid is capable of decomposing about 9½ ounces of the carbonate of barytes, whereas the same measure of the nitric will require 20 ounces for saturation; it is therefore evident that the College should have assigned the proper proportions acid and carbonate, or at any rate have directed the nitric acid to be saturated.

In concluding our examination, we may state that the Edinburgh Pharmacopœia contains numerous points of minor importance, requiring attention and amendment, in addition to the graver errors which we have detected and exhibited. With respect to the Dispensatories, it must be evident that these works imperiously demand the most careful revision and correction to render them either safe guides to the community, or worthy of the reputation of their authors.

Erratum.—P. 218, line 8 from top, for *perceptible* read *precipitable.*

I. HUMAN MAGNETISM; ITS CLAIMS TO DISPASSIONATE INQUIRY; BEING AN ATTEMPT TO SHEW THE UTILITY OF ITS APPLICATION FOR THE RELIEF OF HUMAN SUFFERING. By *W. Newnham*, Esq., M.R.S.L., Author of "The Reciprocal Influence of Body and Mind," &c. 8vo. pp. 432. Churchill, London, 1845.

II. MEDICAL REPORT OF THE CASE OF MISS H—— M——. By *T. M. Greenhow*, F.R.C.S. Highley, London, 1845.

III. VITAL MAGNETISM; A REMEDY. By the *Rev. Thomas Pyne*, A.M., Incumbent of Hook, Surrey. 12mo. pp. 80. Highley, London, 1845.

BEFORE we had received Mr. Newnham's volume for review, we had been led by the remarks of some friends to expect that at length there had appeared a calm and temperately-written work on a subject, which has certainly—we shall not at present say how justly—met with rather rough handling from medical critics. On reading the title-page, we augured well; as it seemed to promise what we have for some time past been wishing to meet with, and we thought within ourselves, "now surely we shall have some facts to deal with, and authentic reports of well-observed cases drawn up by an enlightened and discriminating practitioner, in place of those silly gossiping tales, better suited for the wonderment of an old-maid's tea-party than for discussion by men of reflection and experience, that have of late years been related by the Rev. this or Rev. that, and certified by this literary lady and that learned lawyer." Our mind, although any thing but favorable to the claims of Mesmerism, was quite prepared to give a patient hearing to whatever might rationally be adduced in its defence, and we were ready to weigh, in the scales of fairness and truth (we trust,) any well-authenticated data that might be brought forward by a professional man; the evidence of the *laity* in such a matter being we need not say, almost entirely valueless.

Such was the state of our feelings when we cast our eyes over the dedicatory epistle, which Mr. Newnham has addressed to his friend the Reverend Thomas Osmond Fry. One expression in it certainly startled us not a little, and somewhat disconcerted the estimate which we had formed of our author's judgment. We proceeded to the perusal of the introductory Chapter, in the hope of recovering our good opinion of him upon better acquaintance; but in this we were disappointed. On, however, we pushed, the mild angel Charity, "that thinketh no evil," leading the way; but even her sweet influence could not prevail; our fears increased, our hopes gave way, one by one; we became puzzled, perplexed, surprised and distressed; we began to suspect that our eyes deceived us; we looked again and again; but, alas! there was no mistake; we plunged from one step of bewilderment to another still more profound, until at length we were utterly lost in stark, if not indignant, astonishment. Before giving our readers the benefit of a few extracts from Mr. Newnham's work, it may be as well to inform them that, not more than twelve months ago, he

was so little of an admirer of Animal Magnetism that he was *then* actually "asked by some friends to write a paper against it;" and that *now* he is so undoubting and devoted a believer in its whole truth, that he readily gives his entire assent to all the mysteries of Clairvoyance, Translation of the Senses, Foreknowledge of Events, &c.; and is moreover so smitten with the anticipations of the value of his own performances, that he addresses his friend (to whom he dedicates the work) as one "to whom I think posterity will be grateful for having stimulated an enquiry, which I venture to foresee will ultimately be productive of relief to some of the sorrows of life." Now for a few illustrations of this enquiry that is so rich in promise of good to mankind. The following is a *fact*:—

"During clairvoyance, *no knowledge is elicited*, no opinion given, *not previously possessed* by the magnetiser or magnetised,—at least in its germ, if not in its development. For instance, a Turkish somnambulist will never give *Christian views or opinions, unless the magnetiser be a Christian.*" 200.

A little further on we read that—

"Somnambulists may be more or less clairvoyans,—more or less perfect,—and may offer very varying phenomena: but the almost invariable attributes of this state are the faculties of seeing with their eyes closed,—their intimate connexion with their magnetiser,—the development of their intellectual faculties,—the insight into their own structure,—and the foresight of their approaching maladies." 237.

The following piece of metaphysical trancendentalism we must give without comment, for the best of all reasons; we do not understand it:—

"We believe in the existence of sight, without the aid of the eyes, in the magnetic condition;—but the measure of this belief is not the same as that which we possess in consequence of seeing with our own eyes. And the reason is obvious. First, if we doubt about the report of our eyes, and before lengthened habit has taught us to trust in their accuracy, we test that accuracy by the aid of some of the other senses, as touch, taste, &c.;—witness the attainment of knowledge by infants: and clairvoyance should be considered somewhat in the same light. Then, again, long habit has taught us to trust in the report of the eyes;—and for the same reason, we SEEM *to understand* that report: while, on the other hand, though we admit the facts, they do so manifestly transcend our present understanding, that although not *more inexplicable* than ordinary sight, *sixty years after the creation*, now *seem* to be so, on account of the difference of associated circumstances." 293.

Whether it be from diffidence, or from the hitherto-limited sphere of his experience in the mysteries of his new craft, that Mr. Newnham adduces so few cases from his own note-book, we cannot tell; but certain it is, that almost all his reports of cases are derived from foreign works. The former are, as a matter of course, doubly valuable, and deserve our special notice upon the present occasion. What do our readers think of this one?

After giving the particulars of "an exceedingly good case" of epilepsy in a girl 11 years of age, cured mesmerically by Dr. Inglis of Halifax, (who very modestly remarks at the close of his report that "an approving conscience gave me my reward,") Mr. Newnham proceeds to observe:—

"A similar case reached me a few days since, from a clergyman:—and it is not many weeks since a lady was describing to me the agonies of her baby, and

its cries for three hours, which nothing would pacify until she *stripped it and herself*, and laid it upon her stomach, when in a few minutes it was relieved, and sank into a peaceful slumber. Here, again, was a case of unconscious magnetism—and no possibility of the intervention of the imagination." 141.

The next case of our author's that we have been able to ferret out from amidst a farrago of the most astounding trash, is the following:—

A young clergyman mesmerised his sister, who soon fell asleep, and continued so for five hours, in spite of all his endeavours to awake her. After distinctly exhibiting some of the phenomena of Clairvoyance, &c., he wished to arouse her; but this he could not do with all his endeavours. He at last bethought himself of asking her *whether she would awake naturally, and when*—to which she replied affirmatively, and *in half an hour:* this took place accordingly, and exactly.

This remarkable "case of genuine unsophisticated magnetism with clairvoyance and prevision," we are informed, "has recently come within our (author's) own knowledge."

His third case reminds us much of the far-famed one of the Okeys; and who is there that has not heard of Dr. Elliotson's wonderful girls? By the bye, this prince of English Mesmerists is rather shabbily treated, we think, by one who is but a neophyte and sciolist in the art. At page 124 of his work, Mr. Newnham very discourteously remarks, that "the doctor is no friend or favourite of ours;" and subsequently, when discussing the metaphysico-physical subject of Phreno-Magnetism, he thus describes the character of his mind:—

"We must allow," says he, that this state, if it be true, is a very extraordinary one; and we may even earnestly wish that it had been introduced to notice by persons of less lively imagination, and more sober judgment than Drs. Elliotson and Engledue:—for, although we entertain the highest respect for their talents, we cannot say that we equally highly appreciate their judgment; and we confess that we think their imaginations too liable to be captivated by the charms of novelty,—and therefore more easily led astray by some brilliant and unreal phantom." 376.

He afterwards compensates in some degree for this niggard praise, by styling Drs. Elliotson and Engledue, "these two great men, *whose cerebral organism seems to have been cast into* (the Italics are not ours) the same mould:—pity is it, that we are not acquainted with the cerebral organisms of their immediate progenitors!"

Mr. Newnham, we should remark, eloquently defends his newly-adopted science from the charge of ignoble birth and short descent. It was known, he tells us, in the remotest times, to the Hindoos and Egyptians, the Jews and Persians. By the Greeks, it was termed the *sacred mysteries;* and in the middle ages it was known under the names of *magic*, the *black art*, and the *occult sciences*, &c. He takes vast pains to prove that it is one of the greatest boons, which Heaven in its mercy has bestowed upon mankind. His zeal, however, rather than his discretion, is manifested by the constant introduction of religious topics and language that he indulges in. But on this, as on most other matters, his judgment cannot be well trusted. For example, he very unnecessarily proclaims himself to be a Materialist. In excuse, it may be said, that he sometimes plunges into the discussion of subjects that are far too abstruse for his mind; and then

he gets bewildered, and gives utterance to what he does not fully understand.* Even on mere professional matters, his opinions seem to be often most unsteady and unsound;—so much so, that we have more than once, during its perusal, hesitated to believe that this work could have been written by an educated medical man. Neither can its literary merits be estimated much higher. The sentences sometimes extend to a page or two in length, and are every now and then garnished with the merest *niaiserie* of thought and language. We looked for *facts*, and our author gives us *words*. Among other things he supplies a sketch of Chardel's views, the foundation of which is, that *light is the principle of life*. What they have to do with the subject-matter of his book, it is hard to comprehend. He re-produces the long reports of the French Academy on the subject of animal magnetism; betraying, every now and then, a most unpardonable ignorance—we shall not say a discreditable misrepresentation—of the characters of some of the ablest men in the French metropolis. He repeats and seemingly with credulous approbation, the ravings of a madman before the French Revolution, and the "remarkable previsions" of poor Joan of Arc! The existence of the *second sight* of the Scottish Highlanders is also put down as an undoubted fact! But what can we expect from a man who avows his belief that water and food and trees may be magnetized for the benefit of man! "Tell it not in Gath, nor publish it in the streets of Ascalon;" else every *quack* of the realm will start into madness, and joining together, as with magnetic unanimity, will cry aloud for their rights, and call on Sir James Graham to declare, how far the *regulars* may go, and where empiricism is to begin.

Our readers have probably had quite enough of Mr. Newnham by this time. If any one should ask why we have been so severe in our comments on his work, we answer at once that we have had a twofold reason: first, the silly character of its contents; and secondly his unwarrantable aspersion of the motives of his professional brethren who do not think as he does. Passing over his remarks on the incompetency and want of candour of medical men in examining such an abstruse subject as that of Animal Magnetism, we must look back to page 15, where he does not hesitate to charge them with mercenary considerations in their opposition to its claims:—

"We shall mention but one other cause, and we trust not *very* operative, but still *one*, which to a *certain extent* must have its influence. 'Il faut vivre,'—and true, most true it is, that in general it is very sorry living; and that medical men are engaged in a perpetual and most arduous struggle, to maintain themselves and their families in their proper station. Now, in spite of the most disinterested benevolence, the law of self-preservation will be uppermost, and there must be an inevitable prejudice excited against every thing which may decrease the means

* What other explanation can be given of his inconsistency? for at the commencement of his work, we meet with the following passage:—

"Thus magnetism has been combined with scepticism and infidelity, and it is not to be denied that it has been often thus *associated*. But it has no *necessary* connexion with such errors; and the *conversion of Georget* late in life from materialism to spiritualism, is entirely to be attributed to his conviction of the truth of magnetic phenomena." 5.

of subsistence,—and of this number must be reckoned human magnetism; but if so, its friends will be slowly gained, and generally recruited from those who are not so dependent for their daily food. It is impossible not to admit, that this argumentum ad crumenam *must* bias the minds of many against any change which may endanger the hope of their gains and tend in any degree to supercede their craft, or at all events to endanger its estimation." 16.

Has the writer of such a passage as this any right to look for leniency at the hands of those who seek to uphold the dignity of our profession!

With respect to Mr. Greenhow's Report of Miss Martineau's case—which, by the bye, seems to be thought highly of by Mr. Newnham—we should have thought that it did not merit the distinction of being made the subject of a separate pamphlet. The lady seems to have suffered at first from a sort of chronic inflammation or irritative condition of the uterus. This organ subsequently became retroverted, and swollen in its substance. Sir Charles Clarke was consulted in 1841, and evidently formed a favourable opinion as to the *result* of the affection. As a matter of course, there had been all along more or less constitutional disturbance, and especially of the nervous and digestive systems. The general health had for some time been improving, and the local malady diminishing, under the judicious treatment that had been followed out under the directions of Mr. Greenhow; when, in June last, she commenced the Mesmeric treatment—which has worked such marvels, according to her own report. Any other novel and pleasing impression on her mind would doubtless have done the same. Dare we hint at the probable effect which a change of name might have had, even upon a lady of her malthusian principles? Be this as it may, we venture to predict that the permanency of her cure will depend very much upon herself. If she loses faith in Magnetism, and does not substitute some other pleasing whim in its stead, it would surprise us little to hear of her falling back into her former state of health—when, says Mr. Greenhow, "she never willingly listened to my suggestions of the probability of such prospective events (her recovery, &c.) and seemed always best satisfied with anything approaching to an admission that she must ever remain a secluded invalid." This, by the bye, is a curious, but not uncommon feature of certain states of *ill health* in unmarried women.

If Mr. Pyne is not a better priest than he is a physician, woe betide his parishioners: they must surely have good cause to repine. Among other curiosities, the Rev. Gentleman is of opinion that Naaman the leper, of whom we read in Scripture, certainly alluded to animal Magnetism, when he said of Elisha: "I thought he would surely come out to me, and stand and call on the name of the Lord his God, and strike his hand over the place (move his hand up and down—Hebrew), and recover the leper."

Some of Mr. Pyne's own cures seem to us to be nearly as miraculous as that effected by the Prophet himself. For example: A man had a rusty edging iron run into his foot; a surgeon told him it had gone to the bone; he was in great pain, and unable to put his foot to the ground. He was mesmerised; in a few minutes he was well, and signed his name to these words:—"I feel cured, I thank God. I shall carry my crutch and stick, for I shall run home, or a part of the way." Who dare resist the claims of Animal Magnetism after this? Scoffers and infidels, beware!

The Duality of the Mind proved by the Structure, Functions, and Diseases of the Brain, and by the Phenomena of Mental Derangement, and shewn to be Essential to Moral Responsibility. With an Appendix: 1. On the Influence of Religion on Insanity. 2. Conjectures on the Nature of the Mental Operations. 3. On the Management of Lunatic Asylums. By *A. L. Wigan,* M.D. 8vo. pp. 459. London: Longmans, 1844.

Dr. Wigan's work, whatever may be thought of its other merits, may at least claim that of novelty; indeed, we do not recollect any production of late years, during which a more cautious spirit has been introduced into philosophical inquiries, displaying so much speculation, and that of the most startling kind. This "New View of Insanity" also evinces much acute observation, combined with a benevolent spirit, and many of the instances and illustrations adduced by the author in support of his theory are plausible and ingenious. But, in readily admitting the just claims of Dr. Wigan, we confess that we have finished the perusal of this work sceptical as to his conclusions, or rather, to speak more plainly, with the conviction that the hypothesis of the Duality of the Mind, as presented to public notice in the treatise before us, is an entire fallacy. The author observes in the Introduction :—

"The unsettled state of mental philosophy in the present day is such as to justify any man in the endeavour to throw light on a subject so dark and intricate, more especially if the discovery of a new instrument seem to give new and extraordinary facilities for the investigation. Physiological reasoning could advance but a little way till the circulation of the blood was ascertained; and whatever may be the degree of merit awarded to myself on the present occasion, I cannot but think that I bring to the investigation of the mental phenomena in health and disease a new power, of at least equal importance, and capable of equally satisfactory demonstration." P. 2.

Coinciding with the remarks contained in the former part of this paragraph, we regret that it is not in our power to admit either the degree of importance claimed for the doctrine of the dual mind, or the satisfactoriness of the demonstration by which the attempt is made to support it. And we make this last remark with no desire to disparage the labours of Dr. Wigan, for the truth is, that the subject is not susceptible of the kind of proof by which Harvey did in reality *demonstrate* the course of the blood. The regular and definite propulsive actions distinctly seen by observing the heart of the living reptile; the mode of attachment and obvious mechanism of the valves contained in the veins and at the origin of the aorta and pulmonary artery; the turgidity caused on the distal side of the ligature when a vein is tied and on the cardiac side in the case of an artery; the hemorrhage which in the instance of a wounded artery proceeds from the end towards the heart, but which from an injured vein proceeds from the remote extremity; these, it is apparent, are facts of a totally different kind from any which can be obtained in the investigation of the mind. This passing notice of the facts which established the true

theory of the circulation, forces upon us the recollection that there is indeed one discovery of modern times which may strictly be compared with that of the illustrious Harvey—it is that of Bell, who, by his profoundly philosophic researches. and by demonstrating the course of the nervous currents, accomplished for the nervous system what his great predecessor effected for the vascular.

We have further to remark that, in those parts of the argument where anatomical and physiological proofs or illustrations are adduced, the author is particularly unfortunate in his selections. At page 36, for example, the following passage occurs: "The ganglionic, or great sympathetic system of *little brains* in the interior of the body, connected by a net-work of nerves (like the additional spring to a watch, to enable it to go while winding up,) carries on the functions of life during sleep, while the action of the cerebral organs is suspended." And again (p. 143) in alluding to the fact that, the pressure of the finger upon the brain of an animal in a physiological experiment causes coma, it is stated, "the body remains a mere lump of organized matter dependent on the ganglionic system for its vitality." These propositions embody a profound physiological error; so profound indeed, that it naturally excites a doubt. if any one entertaining such crude notions, can be qualified to undertake an inquiry of the most subtle character and involving the highest functions of the nervous system. Setting aside all the uncertainty which at this time prevails respecting the powers of the great sympathetic in maintaining the circulation, no one who from the time of Le Gallois to Marshall Hall has investigated the subject, has any doubt that during sleep and in the comatose condition, as at all other times, the vital motions of respiration are essentially dependent on, and are sustained, by the medulla oblongata and the upper part of the spinal cord, operating through the pneumo-gastric and phrenic nerves.

Without, however, dwelling in this place longer upon the impressions excited in our own mind by Dr. Wigan's treatise, we will lay before our readers sufficient extracts to enable them to judge for themselves, a mode of procedure which, where there is so much novelty and so much speculation, will be most fair towards the author and most satisfactory to ourselves. Dr. Wigan's hypothesis is thus explained:—

"Entertaining no doubt whatever that every candid man, after reading these remarks, will at least adopt my nomenclature, I shall in future speak of the two cerebra instead of the two hemispheres; being certain that I shall prove the propriety and utility, nay, the absolute necessity, of using the former term instead of the latter, which has led (as I shall shew) to false inferences, and has no advantage whatever to counterbalance the mischief.

I believe myself then able to prove—

1. That each cerebrum is a distinct and perfect whole, as an organ of thought.
2. That a separate and distinct process of thinking or ratiocination may be carried on in each cerebrum simultaneously.
3. That each cerebrum is capable of a distinct and separate volition, and that these are very often opposing volitions.
4. That, in the healthy brain, one of the cerebra is almost always superior in power to the other, and capable of exercising control over the volitions of its fellow, and of preventing them from passing into acts, or from being manifested to others.
5. That when one of these cerebra becomes the subject of functional disorder

or of positive change of structure, of such a kind as to vitiate the mind or induce insanity, the healthy organ can still, up to a certain point, control the morbid volitions of its fellow.

6. That this point depends partly on the extent of the disease or disorder, and partly on the degree of cultivation of the general brain in the art of self-government.
7. That when the disease or disorder of one cerebrum becomes sufficiently aggravated to defy the control of the other, the case is then one of the commonest forms of mental derangement or insanity; and that a lesser degree of discrepancy between the functions of the two cerebra constitutes the state of conscious delusion.
8. That in the insane, it is almost always possible to trace the intermixture of two synchronous trains of thought, and that it is the irregularly alternate utterance of portions of these two trains of thought which constitutes incoherence.
9. That of the two distinct simultaneous trains of thought, one may be rational and the other irrational, or both may be irrational; but that, in either case, the effect is the same, to deprive the discourse of coherence or congruity.

Even in furious mania, this double process may be generally perceived; often it takes the form of a colloquy between the diseased mind and the healthy one, and sometimes even resembles the steady continuous argument or narrative of a sane man, more or less frequently interrupted by a madman; but persevering with tenacity of purpose in the endeavour to overpower the intruder.

10. That when both cerebra are the subjects of disease, which is not of remittent periodicity, there are no lucid intervals, no attempt at self-control, and no means of promoting the cure; and that a spontaneous cure is rarely to be expected in such cases.
11. That, however, where such mental derangement depends on inflammation, fever, gout, impoverished or diseased blood, or manifest bodily disease, it may often be cured by curing the malady which gave rise to it.
12. That in cases of insanity, not depending on structural injury, in which the patients retain the partial use of reason (from one of the cerebra remaining healthy or only slightly affected,) the only mode in which the medical art can promote the cure beyond the means alluded to, is by presenting motives of encouragement to the sound brain to exercise and strengthen its control over the unsound brain.
13. That the power of the higher organs of the intellect to coerce the mere instincts and propensities, as well as the power of one cerebrum to control the volitions of the other, may be indefinitely increased by exercise and moral cultivation; may be partially or wholly lost by desuetude or neglect; or, from depraved habits and criminal indulgence in childhood, and a general vicious education in a polluted moral atmosphere, may never have been acquired.
14. That one cerebrum may be entirely destroyed by disease, cancer, softening, atrophy, or absorption; may be *annihilated*, and in its place a yawning chasm; yet the mind remain complete and capable of exercising its functions in the same manner and to the same extent that one eye is capable of exercising the faculty of vision when its fellow is injured or destroyed; although there are some exercises of the brain, as of the eye, which are better performed with two organs than one. In the case of vision, the power of measuring distances for example, and in the case of the brain, the power of concentrating the thoughts upon one subject, deep consideration, hard study; but in this latter case, it is difficult to decide how far the diminished power depends on diminution of general vigour from formidable and necessarily fatal disease.
15. That a lesion or injury of both cerebra is incompatible with such an ex-

exercise of the intellectual functions, as the common sense of mankind would designate *sound mind*.

16. That from the apparent division of each cerebrum into three lobes, it is a natural and reasonable presumption that the three portions have distinct offices, and highly probable that the three great divisions of the mental functions laid down by phrenologists, are founded in nature; whether these distinctions correspond with the natural divisions is a different question, but the fact of different portions of the brain executing different functions, is too well established to admit of denial from any physiologist.

17. That it is an error to suppose the two sides of the cranium to be always alike, that on the contrary, it is rarely found that the two halves of the exterior surface exactly correspond; that indeed, in the insane, there is often a notable difference—still more frequent in idiots, and especially in congenital idiots.

18. That the object and effect of a well-managed education are to establish and confirm the power of concentrating the energies of both brains on the same subject at the same time; that is, to make both cerebra carry on the same train of thought together, as the object of moral discipline is to strengthen the power of self-control; not merely the power of both intellectual organs to govern the animal propensities and passions, but the intellectual antagonism of the two brains, each (so to speak) a sentinel and security for the other while both are healthy; and the healthy one to correct and control the erroneous judgments of its fellow when disordered.

19. That it is the exercise of this power of compelling the combined attention of both brains to the same object, till it becomes easy and habitual, that constitutes the great superiority of the disciplined scholar over the self-educated man; the latter may perhaps possess a greater stock of useful knowledge, but set him to study a new subject, and he is soon outstripped by the other, who has acquired the very difficult accomplishment of *thinking of only one thing at a time;* that is, of concentrating the action of both brains on the same subject.

20. That every man is, in his own person, conscious of two volitions, and very often conflicting volitions, quite distinct from the government of the passions by the intellect; a consciousness so universal, that it enters into all figurative language on the moral feelings and sentiments, has been enlisted into the service of every religion, and forms the basis of some of them, as the Manichæan." P. 30.

The author frequently adduces the provision of two eyes and two ears, as an argument not only for the provision of "two distinct and perfect brains," but also of two minds. In connexion with this subject the author, in the following passage, has been led by his favourite theory into what, as it seems to us, is a palpable error: A gentleman, owing to an injury of the head, for a short time lost his memory and power of articulation, and although these were soon restored, two days subsequently "he heard two voices close to his ear, in rapid dialogue, almost without meaning. When reading, similar voices seemed to accompany him, sometimes getting a few words in advance, but not beyond what the eye might have reached. *I call this one brain reading faster than the other.*" Without dwelling upon the looseness of this conclusion in other respects, we would remark that it involves a physiological impossibility, for, as the impressions from the book must have been conveyed by the two optic nerves to the brain at precisely the same instant, the perceptions, even allowing them to have been double, must have corresponded *as to time*.

But the question of duplex *organs*, is totally different from that which

relates to a double power of *perception*—of *comparison*—of *judgment*; so that the brain may be, as indeed it frequently has already been considered, as double *quoad* organs, but not as concerns functions. And we may further remark, that in order to associate the double organs composing the cerebrum, and to convert them, as to action, into *one instrument*, the transverse commissures, as they are termed, are provided, and so elaborately are they developed that it is probable every individual part of the brain on one side, is brought into connexion with the corresponding part of the other side. Now, in the case of the double organs, such as the eye, the ear, the two arms, and so forth, which do act singly, no such organic connexion is established; it is met with only in the organ of the mind. In alluding to a case which had been pointed out as opposed to this theory, Dr. Wigan, in speaking of the corpus callosum, says, the case "fully confirms my opinion that it is an organ of no importance, and not necessary to the functions of the brain." Those who have traced the extent and relations of this, the largest body in the brain, or who have studied the accurate plates of Mayo, Solly, and Arnold, will scarcely admit the probability of this opinion, nor will they place much faith in a doctrine which requires for its support such an extraordinary assumption. It is another of Dr. Wigan's positions, that "one of the cerebra is almost always superior to the other;" no proof of this is, however, given, as far as we can perceive, beyond the bare fact, to which no physiologist would attach any importance as an argument of this kind, that inasmuch as the right arm and right leg are more powerful than the left, it is to be inferred that the left brain acts more energetically than its opposite fellow.

A great number of cases, some consisting of those slighter forms of delusions, which, although they never occur in the perfectly healthy mind, do not amount to insanity, and others of decided insanity, are adduced in support of the theory before us. One or two of these cases will, in connexion with the above extracts, illustrate the author's train of argument.

We have the following explanation of those day-dreams in which all of us have at some time or other indulged, and which we therefore submit as a kind of typical embodying of Dr. Wigan's views:—

"The well-known process called castle-building—in which some persons can indulge till the false impression shall influence their actions—seems to me explicable in the same manner. One brain is allowed to go on with a train of thought which produces pleasurable sensations, unchecked by the conscious other, till the effort required to stop the disordered process becomes difficult or impossible. While the volition remains omnipotent, the case is merely the power of dwelling exclusively on pleasurable ideas—of which hope is one of the forms—the further indulgence of the habit produces almost the effect of truth, and the dull realities of life become insipid." P. 118.

A case of mental delusion is related of a man who was convinced that he was haunted by a kind of *second self*. This alter ego "would argue with him pertinaceously, and to his great mortification sometimes refute him, which, as he was very proud of his logical powers, humiliated him exceedingly." "In sitting by his side, I sometimes heard him exclaim 'well, that takes me quite aback, I must consider a little for an answer.'" "I know not what effect such an example might produce on others, but to me it seems only to be explained on the hypothesis of two brains with distinct and contradictory trains of thought at the same time. The infer-

... seems irresistible that, with conflicting volitions and conflicting trains of thought, there are in the disordered cerebrum two perfect and complete organs of the understanding in habitual antagonism, and that uniformity of will, when consentaneity does not exist, is produced by the tyranny of one brain over the other." P. 127.

"In summing up what has been said, I think it may be assumed without risk of contradiction, that the fact of each brain being a perfect and complete instrument of thought is abundantly proved. That each, while in health, corresponds entirely in action with its fellow, is obvious from the fact that this unison and correspondence give only one result, as in the case of the two eyes producing single vision. That when from any cause one brain is disordered, a discrepancy in the two processes of thinking takes place. That the healthy brain (aided by the action of such of the organs of its fellow as are not affected by the disorder which disturbs the others) can, in nearly nine hundred and ninety-nine cases in a thousand, according to the usual proportion in this country, control all manifestation of morbid emotion or judgment, and that the thousandth case is the madman." P. 275.

These extracts will enable our readers to comprehend the theory advanced by Dr. Wigan. For ourselves, we must re-iterate our dissent, as it seems to us that all these and similar cases can be satisfactorily explained by regarding them as so many different forms and degrees of disturbance affecting the faculties of a single consciousness. No *proof is* given in these mental hallucinations of the real and independent existence of two intellectual entities; on the contrary, as the author himself states, there are in most cases of insanity where this double train of thought is going on, occasional lucid intervals, in which the unhappy patient *is* conscious of the deceit and of his own individuality.

Although we cannot accede to the peculiar views of Dr. Wigan, we most willingly bear our testimony to the philanthropic spirit pervading the whole treatise.

His observations on the causes of insanity are also most just, and are worthy of the serious consideration of all who, whether professionally or otherwise, are called upon to minister to the insane, the most afflicted class of our fellow-beings. The fact that every form of mental derangement depends upon some form or other of cerebral disease—and by this term we signify every, the least, departure from the standard of health, is at length pretty generally admitted; but notwithstanding this, the remarks we are about to make are so apposite that they will not be misplaced:—

"The word *insanity* means *un-health*, and it means nothing more. Why the term should have been applied to the class of diseases which, by disordering the brain, disturb the intellect, I know not; but the consequences of such restriction of its meaning have been mischievous. We are led to seek the causes of insanity as if it were *a disease*, whereas it is the effect or result of many diseases. The physician is expected to cure a disorder of the *mind*, as if it were something quite distinct from a disorder of the body. This is exactly equivalent to the step of which I have elsewhere spoken, of addressing a watchmaker thus: 'Here is my watch—the motion is wrong, and I have brought it to you to be put right; but you must not touch the works—all the wheels, pivots, springs, balances, verge, contract pinion, and so forth, are quite in order. I do not know the structure of a watch, for I have never taken one to pieces or put it together, but have read books on the subject, and from the knowledge thus acquired, am sure that there is nothing wrong in the machinery of that I am now putting into your hands; therefore I beg you will not touch the works, but merely set right *the motion*, for that is the only defect.'" P. 117.

In considering *the forms* of mental derangement, we feel it due to the science of Phrenology to express our conviction that the four great classes of intellectual phenomena—the propensities, the sentiments, the perceptive, and the reflective faculties, contended for by Spurzheim and his school, have a real existence; but in making this admission, we are by no means satisfied of the 35 subdivisions, and as to that which constitutes the peculiar part of this doctrine, the localization, namely, of these subdivisions in certain definite convolutions of the brain, we hold it not proved.

The adoption of so much of the phrenological system, and this is the amount of belief accorded to it by Dr. Wigan, will enable us to form conceptions respecting the various types of mental disturbance, and how it happens that one class of phenomena may remain intact, whilst another class is utterly deranged. The best writers upon this subject have marked these distinctions. Thus, to say nothing of monomania, in which there is illusion upon one particular subject only, we have that most prevailing species of disorder which has been well named "moral insanity," in which as Esquirol remarks, although the passions and moral affections are perverted or destroyed, it may be difficult or impossible to trace any hallucination or disturbance of the perceptive and reflective faculties. The great frequency of this form of derangement, which is in fact much more prevalent than any other type, indicates the importance of considering how the tendency towards it may be controlled or prevented; there is, indeed, no question which more nearly concerns the well-being and happiness of society, nor one in which our profession, by inculcating right views, can more effectively benefit the community. A pamphlet having for its title, "On Man's Power over himself to prevent or control Insanity," by the Rev. J. Barlow, Secretary of the Royal Institution, contains some excellent observations upon this subject; the principal position contended for being "that the difference between sanity and insanity consists in the degree of self-control exercised." Excluding those cases which depend upon *physical* causes, though even a large number of this class is produced by vicious habits,* it is apparent that a considerable number of the cases met with in every asylum may be traced to a want of that rigid discipline of the mind, which is one of the most difficult, and yet one of the most important of the moral lessons, which man has to acquire on this side of the grave. Domestic griefs, reverses of fortune, jealousy, injured self-love, religious enthusiasm, what are these, the potential "moral causes" of insanity, but so many trials which come to all of us, and which, if not moderated by firmness, by humility, and above all, by the pervading conviction of the uncertain tenure of all earthly happiness, will overturn the throne of reason. Mr. Barlow well observes, "should my position, that the difference between sanity and insanity consists in the degree of self-control exercised, appear paradoxical to any one, let him note for a

* For example, out of 256 cases, dependent upon physical causes, as investigated by M. Esquirol at the Maison Royale de Charenton, 127, or more than half, were produced by causes resulting from defective moral control; Masturbation 23, Libertinism 24, Use of Mercury 16, Abuse of Wine 64.

short time the thoughts that pass through his mind, and the feelings that agitate him; and he will find that, were they all expressed and indulged, they would be as wild, and perhaps as frightful in their consequences, as those of any madman. But the man of strong mind represses them, and seeks fresh impressions from without, if he finds that aid needful: the man of weak mind yields to them, and then he is insane."

The experience of the best observers confirms this view of the subject. How important are these remarks of Dr. Conolly; "seeing that any feeling in excess—the love of pleasure, or of ease, or of money, or of expense, or of applause; or that self-denial, or anger, or jealousy, or hope too sanguine, or sorrow too much indulged—may become independent of the restraint of the comparing powers, and thus impair or disorder the understanding, we cannot but remark the importance of cherishing that governing and protecting action of the mind by careful cultivation and exercise." "Whoever will converse with lunatics, will soon be satisfied that a very small portion of them consists of persons whose talents have been regularly and judiciously cultivated."

A knowledge of the evils arising from this want of self-control is indispensable to the right treatment of insanity; for, although it is indeed a difficult task to awaken those better feelings which have long slumbered, or, which is worse still, have never been acquired, the almost unhoped-for success which has attended the non-restraint system, and its concomitant adjuncts, mental and bodily occupation, is all-sufficient proof that intelligence and zeal, combined with benevolence and patience, will, in the end, triumphing over all obstacles, be rewarded with the happiest results.

We must here conclude our notice of Dr. Wigan's "New View of Insanity," which, without departing from the opinion we have expressed of its fallaciousness, we commend to the notice of our readers, as worthy of perusal, on account both of the great interest of the subject, and of the ingenuity evinced by the author.

The Natural History of Animals; being the Substance of Three Courses of Lectures delivered before the Royal Institution of Great Britain. By *Thomas Rymer Jones*, F.R.S., F.Z.S., Professor of Comparative Anatomy, in King's College, London; late Fullerian Professor of Physiology, R. I. Vol. I. pp. 362. London, Van Voorst, 1845.

The Literature of Natural Science has, within the last few years, undergone a very remarkable change. The demand of scientific instruction for the million, and amongst the million, especially for female readers, has called forth numerous publications, of various degrees of merit indeed, but some of which, popularly as they are written, and divested as far as possible of scientific peculiarities of language and style, are not unworthy of the distinguished authors from whose condescension they have emanated. The rage for popular lectures by which

the society of the present day is characterised, has, in more instances than one, occasioned the publication of "the substance" of such lectures in the form of an elementary work, on the subject on which the lecturers themselves had treated; and a very cheap and expeditious mode of book-making has thus been adopted, by simply altering the subjective pronoun from the second to the third person, and reducing the illustrations of diagrams and realities to pretty and well-engraved wood-cuts. We confess that we see nothing to complain of in all this; on the contrary, it appears to us, that it is the only way in which popular lectures can be rendered really available to the purpose of solid instruction, at least to the great majority of that class of persons who frequent them with the greatest avidity. We think we could now point out, within the small circle of our very limited acquaintance with the so-called scientific public, not a few, we will not say of ladies blue or grey, but of gentlemen, highly educated in other matters, and mixing much in scientific society, whose attendance at the popular lecture-room has been unceasing, month after month, and year after year, and yet whose information on those very matters to which they have been for so long a time and so often listening that one would suppose they must almost have acquired the very words of their teachers by heart, brings them scarcely beyond the very threshold of science. We will not go so far as a distinguished divine, who once asked a clerical friend whether he really believed that any one person had ever derived any benefit from hearing sermons,—we will not assume so exclusive a tone as respects the comparative utility of popular lectures, delivered to persons who seek only for superficial information, but we do confidently declare our belief, that no one ever became even moderately acquainted with any science whatever by listening to lectures, and especially such lectures as are ordinarily delivered in the popular theatres of our popular Institutions. The well-grounded student of Natural History or of Chemistry, frequenting the great theatre of Albemarle-street, will often come away fraught with new and beautiful facts, or with fresh arrangements of his former knowledge;—*he* will have gained real advantage. But the uninitiated, however he may be amused, will not there become a proficient, nor the superficial solidly informed.

The subject of comparative anatomy, and of zoology as associated with it, is not to be excluded from those to which we have alluded; and, in illustration of the truth of our position, we will adduce the popular Professor, the idolized of his class, male and female, wherever he holds forth—(such at least would appear to be his happy lot from the brief but pithy preface)—the author of the work which we are about to introduce to our readers. His popularity is indeed enviable. He assures us that, "the present work actually owes its origin to the flattering manner in which the lessons it contains were listened to by numerous and attentive audiences in several of the leading institutions in the Kingdom." And yet we doubt very greatly whether even our worthy Professor could put his hand upon one of his "numerous and attentive auditory" in all these various parts of the kingdom, who has, even from *his* teaching, become, we will not say a well-informed naturalist, but who has carried away from the lecture-room any well-arranged and truthful notion of the subject at all. We are aware of the great unpopularity of the opinion we are now urging. We are

indeed greatly afraid that nothing but the absolute preservation of our incognito would save our ears, after the heretical doctrine we have broached. It is nevertheless true; nor is it, we opine, difficult to find a cause for this comparative inutility of popular lectures. However plainly and slowly the teacher may enunciate his facts or his doctrines, persons unaccustomed to the subject are wholly incapable of carrying on consecutive thought or reasoning upon it. The facts are new to them, the terms and allusions are absolutely unintelligible, and equally so whether the words by which the phenomena or facts are described or designated, rejoice in a Latin termination or an English one. Whether we talk of mollusks, molluscans, or mollusca—of mammalians or of mammalia, of pachyderms or of pachydermata, appears to us to be altogether idle. All the terms in which the descriptions are couched are novel, and therefore unintelligible to the majority of scientific lecture-hunters; and, whilst they are searching for the meaning, or endeavouring to recollect whether those terms have ever come to their ears before, the unconscious lecturer has passed on over sundry [illegible] in the chain of his reasoning, in happy conviction that his auditors [illegible] been following his course with an intelligence equal to his own. We [illegible]t then, that we have no objection to see these fleeting and inefficient means of instruction embodied in the more tangible and available form which has in the present instance called forth the animadversions which we have thought it our duty to make.

Of the matter of which the present work is composed, and of the manner in which it has been presented to the public in its permanent dress, we will now speak.

We have no hesitation in declaring at once that this is, upon the *whole*, a very nice book, as far as it is as yet published; for we have now *before* us the first volume only, or as the author chooses to call it Volume One. Judging from the extent to which the present portion has arrived, the probability is that it will reach at least to three volumes. It is, we repeat, a very nice book; and, although containing little in it that is original—which, after all, would in most cases now-a-days be high praise—the matter it contains is judiciously chosen and well arranged. Its faults are principally those of style, and lie on the surface, and it must be reluctantly confessed that they are neither few nor slight. They are indeed so obvious and so flagrant, that it would be a degree of affectation in us, as great as that which characterises our author's style, where we to attempt to conceal or palliate them. If there be one charm in didactic writing greater than all others, one quality of style more in harmony with the pure sublimity of science, and the essential truthfulness of nature, it is simplicity—and we are free to confess that any approach to bombast or affectation in the description of the beautiful and true and perfect works of God, is so grating to our feelings, and so repugnant to the hallowed and elevated thoughts, which the contemplation of those works is calculated to inspire, that we never meet with so derogatory an association without a painful [illegible] of its absurdity almost amounting to disgust. To this objection our author is, we fear, in no small degree obnoxious. What less, for example, can be said of such a passage as the following, which meets us in limine?

"Is it upon the sea-shore that the student of Nature walks? Each rippling wave lays at his feet some tribute from the deep, and tells of wonders in-

describable—brings corallines and painted shells, and thousand grotesque beings samples left to show that in the sea, through all its spacious realms, life still is found—that creatures there exist more *numerously* than on the earth itself, &c." P. 2.

Again, and we select almost at random, what can possibly be made of such a jumble of metaphors as occur in the following passages? He is speaking of the coral polyps :—

"Let us endeavour to picture to ourselves an extent of the bed of the ocean, spacious as these realms that we inhabit, carpeted with living plants ; every blade of grass and every flower instinct with life, and all the vast expanse busily engaged in deriving from the surrounding water materials for subsistence. Let us consider that, from age to age, the wide-spreading scene is building up, by constant precipitation from the sea, a rocky territory co-extensive with itself, &c." P. 73.

First, then, the corals are living plants, blades of grass and flowers instinct with life. This metaphor is quitted abruptly, and we are introduced to an *expanse* busily engaged in deriving materials of subsistence. Then comes *a wide-spread scene* occupied in building a rocky territory as [illegible] as itself! Now, what possible force or illustration is gained by [illegible] figures as these?

Turn we the page as our author would say, and we are presented with the following paragraph:—

"Some *accident* or *earthquake*, opens a wide chasm in the bottom of the deep ; the sea itself pours through the yawning fissure, and leaps down into the fiery gulf ; the imprisoned steam produced by such a dread catastrophe, putting its Titan shoulders to the vault above, heaved up the vast incumbent roof, *rocks, corals, shells and all!*"

A yawning fissure, a foaming sea, a leaping sea, imprisoned steam having Titan shoulders which it puts to the vault above!

It were too easy to multiply such examples as these, but we desist from the unpleasing and unwelcome task. We would, however, point out some of the faults arising from the same love of display and *fine* writing, such, for instance, as the incessant employment of unnecessary epithets. Thus we have in a very short space, "active polyps"—"hungry polyps"—"eating polyps"—"fishing polyps." The stomach of the Actiniæ cannot be described as capacious without the following fine phrase—"The ample folds *proclaim* its great capacity."

There are also numerous instances of carelessness which we should not mention, but in the hope that the author may be led to correct them in a future edition, which we heartily hope to see, and to avoid them in the future portions of his work. Thus we have in the description of the internal organs of the actiniæ, p. 94, the following incorrect use of the word compartments. "Between the stomach and the fleshy skin, here widely separated, are spacious cavities, divided *by compartments* from each other ;" whilst, at page 97, we have the cavities themselves very properly mentioned as the compartments. As arising from the same fault of carelessness we may mention the author's expression of doubt as to the true animal nature of sponges and fungæ compared with his calling them distinctly "forms of animal life," "such animals as these," &c., a few pages further on. Again, he declares that these animals do not possess a stomach

and afterwards adducing the sponges as an insuperable objection to the ordinary definition of an animal, that it possesses a stomach, he declares that "a stomach is all that is absolutely required. A stomach, provided it can live, is an animal."

Such instances as these are indeed of little consequence, but they evince great want of care, which might be easily avoided. On quitting this part of our task, which nothing but a sense of justice would have imposed upon us, we feel bound to say, that the faults which we have attempted to expose are far less conspicuous towards the latter part of the volume.

The remainder of our duty is indeed an agreeable one. The essential character of the book happily depends upon matters of far greater moment than mere style and taste—and as to the substance of the work, the solid material, the masonry, so to speak, we have pleasure in giving our cordial approbation, however we have been obliged to find fault with the ornamental and extrinsic adjuncts by which it is disfigured. In the first place, however, we would premise that the whole book, as far as it is as yet before the world, is a mere modification of the Author's excellent work on Comparative Anatomy, "The Animal Kingdom," with certain omissions and alterations calculated to render it more acceptable "to ears polite."

The question, which our author does not profess to solve, of the point at which vegetable life ends and animal life begins, in other words, the distinction between an animal and a vegetable being, is handled as we think with considerable tact; and all the difficulties are clearly and candidly, although somewhat tediously stated. The conclusion at which he arrives, in which nothing is concluded, is that "so gradually and imperceptibly do their confines blend, that it is at present utterly *out of* the physiologist's power to declare exactly where vegetable existence ends, and animal life begins"—and he has the following illustration of the difficulty which we think peculiarly happy, notwithstanding the affected manner in which it is put, and the feeble termination of the sentence. "Light and darkness are distinct from each other, and no one possessed of eyesight would be in danger of confounding night with day; yet he who looking upon the evening sky would attempt to point out precisely the line of separation between the parting day and the approaching night, *would have a difficult task to perform.*"

We do not exactly comprehend why the subject of classification is postponed to the full description of the sponges and agastric or hydroid zoophytes. However, so it has seemed fit to the Professor, and we will follow him in his progress. The system adopted is nearly that of Professor Owen; and forms perhaps the nearest approach to the truth of Nature that has hitherto been promulgated. In his Nomenclature there is however a little inconsistency. Not satisfied with adopting Latin terminations to most of his names, he has the association of an occasional English ending introduced, as it were unbidden, into the more classical [illegible]. Thus, we have in the division of the Acrita the following classes; Sponges, Polyps, Infusory Animalcules, Sterelminth*a*, Acaleph*æ*; and in the Homogargliata there are the Anneli*dans* Myriopoda, insecta, Arachnida, Crustacea. Now, in order to be consistent, the Annelidans should be called Annelida, or else we should have Myriopods, Insects, Arachni-

dans, Crustaceans. These are, it is true, matters of very secondary, but still of *some* importance; and they are here indicated as fresh examples of that general carelessness in composition, to which we have seen reason before to call our author's attention.

The substance of the work is excellent. It must be a most useful book for the young zoologist, and for the general reader. Its general views, as far as they go, although we confess we do not think this department constitutes our author's strongest point, are clearly stated, and the anatomical details are given with sufficient precision. The chapter on the important subject of development is, we consider, exceedingly well done. The following illustration of the essential principles of organic development is given in a manner so graphic, as almost to deserve the praise of eloquence; and forms a very agreeable contrast to some of the passages which we have quoted as examples of a different taste:—

"Every one knows how rapidly the puff-balls in our meadows are developed, growing during the course of a single night to a size that would be perfectly incredible, did not ordinary observation teach us the reality of the fact; and yet to the simple question, 'By what means is this extraordinary increase effected?' it has been quite impossible, until very recently, to give anything like a satisfactory reply. On cutting into these living masses, they are found to be quite homogeneous in their texture; the internal part consisting entirely of a spongy substance, without any vessels for the circulation of nutriment, or other complication of structure. When examined, however, with high magnifying powers, every portion of the spongy mass is seen to consist of microscopic cells, which are perpetually springing from each other, every cell producing a new cell precisely similar to itself as soon as its own growth is accomplished; so that in this way millions of millions of these vegetable cells are developed in the course of a very few hours, and by their prodigious accumulation build up a *puff-ball* measuring a foot in diameter."

Before we conclude we must not omit to notice a very material portion of this work, and one on the character of which its usefulness mainly depends—we mean the pictorial illustrations. The wood-cuts are truly first-rate. We know of nothing equal to them in the whole range of anatomical and zoological xylography. Their truth and correctness, no less than their execution, are beyond all praise. If we might select examples of peculiar beauty, we would refer to the *Lobularia*, fig. 14; the magnified view of the cells of *Madrepore*, fig. 19; the *Rhizostoma*, fig. 63; and the interior of the *Echinus*, fig. 91. The cutting is worthy of the designs, which we presume to have been principally furnished by the talented author. We are sorry to have to make an exception to this general praise in referring to the wretched unintelligible figure of *Velella*, fig. 68, which, instead of being light and transparent, is as solid as iron, and almost as opake.

We conclude with a cordial recommendation of the work; and with the hope that the animadversions which it has been our unpleasant duty to make, may induce the author "projicere ampullas et sesquipedalia verba," and to avoid also the careless and, we were going to say, lazy habit that has so materially deteriorated this otherwise excellent book.

URINARY DEPOSITS, THEIR DIAGNOSIS, PATHOLOGY, AND THERAPEUTICAL INDICATIONS. By *Golding Bird*, A.M., M.D., Assistant Physician to, and Lecturer on Materia Medica at, Guy's Hospital. Royal 12mo. pp. 323. Churchill, London, 1844.

WE have for some time past felt the want of a book on urinary diseases, which should give to the practical physician a general view of the recently advanced chemico-pathological doctrines of the Giessen school, in so far at least as they relate to alterations in the conditions of the renal secretion; and point out to him all the available and useful practical hints which are derivable from the present greatly improved state of chemical physiology.

The followers of Liebig have boldly declared that the hypotheses of their master are capable of great and valuable applications to the improvement of practical medicine; and we have been long desirous of seeing the whole subject carefully investigated by a practical man, and one who, though acquainted with, is notwithstanding unbiassed by, the fashionable chemical doctrines of the day.

Dr. Golding Bird has been for some years favourably known to the Profession as an active and highly intelligent physician, who has not confined his studies to what is commonly termed the practical part of his profession, but has, in addition, diligently and very successfully studied the physical and chemical sciences. That the knowledge which he has thus obtained has been usefully applied to the purposes of practical medicine, the work, whose title heads this article, bears ample evidence. It is on a subject peculiarly well adapted for his attainments; for there is, we believe, no department of medicine to which physical and chemical acquirements can be so usefully applied as that which relates to urinary sediments, and we regret to be obliged to add that there is no class of medical subjects on which physicians in general have less knowledge, both theoretical and practical, than that of urinary diseases.

In the year 1843, Dr. Bird delivered, to the pupils of Guy's Hospital, a short course of six lectures on the diagnosis and pathology of urinary sediments, which were published in the *London Medical Gazette*. These lectures form the basis of the present volume; though Dr. Bird tells us that the subject is greatly extended and nearly re-written.

Dr. Bird's work does not supply all the information relating to abnormal conditions of the urinary secretion, which recent investigations have supplied us; for it professes to limit its range to deposits in the urine. But we are bound to confess, that as far as it goes, it furnishes much useful matter of the kind greatly needed.

In addition to some introductory remarks on the clinical examination of urine, and an appendix containing some tables and references, Dr. Bird's work consists of eleven chapters on the following subjects:—1, Physiological Origin and Physical Properties of the Urine; 2, Chemical Physiology of the Urine; 3, Chemical Pathology of Uric Acid and its Combinations; 4, Chemical Pathology of Uric Oxide; 5, Chemical Pathology of Purpurine; 6, Chemical Pathology of Cystine; 7, Chemical

Pathology of Oxalate of lime (Oxaluria ;) 8, Chemical Pathology of the Earthy Salts; 9, Deposits of Black or Blue Coloring Matters; 10, General Pathology of Non-Crystalline Organic and Organised Deposits; and 11, Therapeutical Employment of Remedies influencing the Kidneys.

We propose to notice more or less in detail each of these chapters in the order in which they stand in the original work.

Chap. I. *Physiological Origin and Physical Properties of Urine.*—Dr. Bird commences this chapter with some judicious observations on the indications afforded by the renal secretion: and cautions the practitioner against regarding every abnormal condition of the urine as being in itself a disease, since it is in fact merely a symptom,—an indication of some particular phase of morbid action.

The kidneys perform three important functions: they carry off any excess of fluid which may enter the circulation; they remove any crude or indigested elements of the food, as well as the results of imperfect or unhealthy assimilation; and, lastly, they serve to throw off certain highly nitrogenised combinations formed by the re-arrangement of the atoms of the old tissues.

"It is therefore necessary to recognise three distinct varieties of the urinary secretion in every case under investigation: Firstly, that passed some little time after drinking freely of fluids, generally pale, and low specific gravity, (1.003—1.009) *urina potus*. Secondly, that secreted after the digestion of a full meal, varying much in physical characters and of considerable density, (1.020—1.028 or even 1.030,) *urina chyli vel cibi*. Thirdly, that secreted from the blood independently of the immediate stimulus of food and drink, as that passed after a night's rest, *urina sanguinis*; this is usually of average density, (1.015—1.025,) and presents in perfection the essential characters of urine." 5.

After giving a slight notice of Dr. Prout's ideas respecting primary and secondary assimilation, and of his opinion that uric acid and urate of ammonia are derived from the metamorphosis of the albuminous tissues, while urea and some saccharine principle or its close ally lactic acid, are produced by the gelatinous tissues, Dr. Bird sketches briefly, but clearly, the views of Liebig and Mulder on this subject. Liebig, he says,—

"Has assumed that the ultimate composition of animal flesh, as a muscle, and of blood, can be expressed by the same formula, and are consequently chemically identical. When, therefore, animal fibre is taken into the stomach, it undergoes a kind of imperfect solution, and reaches the circulation, possessing nearly the same chemical composition as the blood with which it becomes mixed. It then undergoes certain changes in the lungs, assuming probably a more highly vitalised condition connected essentially with the conversion of its albumen into self-coagulating fibrin; bodies, however different in their physical and molecular arrangement, identical in composition. Reaching in their course the nutrient capillaries, the elements of the food are deposited in the substance of a tissue, as a muscle, whose waste they thus supply. Ere these new molecules can be deposited, room must be made for them by the removal of old matter, and then the following beautiful results of vital chemistry are supposed to come into play. The exhausted atoms of the muscle cannot be removed as fibres, but their elements must be re-arranged, so as to enter the circulation and be carried to other organs. They therefore undergo metamorphosis; water and oxygen are conveyed to the muscle, the former in the fluid of the blood, the latter in the red particles, and the result is the re-arrangement of elements,

which, whilst it enables the old tissue to be removed with facility, furnishes the pabulum for other and important secretions.

"The late researches of Professor Mulder of Utrecht on the combination of protein with oxygen, have thrown much light on a very obscure part of the act of metamorphosis of tissues, and which constituted the least tenable part of Liebig's hypothesis: he having, as already stated, assumed that oxygen is conveyed to the capillaries in the arterial blood-corpuscles, combined with iron, as sesquioxide—which giving up part of its oxygen, reaches the venous blood as protoxide. This idea can be only regarded as an ingenious assumption, for which no proof is offered by its talented author. All the elements of our food capable of being organised into albuminous tissues, consist of protein ($C_{48} N_6 H_{36} O_{14}$) combined with varying portions of sulphur and phosphorus. Professor Mulder has discovered two oxides of protein, a binoxide and tritoxide, both of which are formed in the animal economy, and constitute, when combined with fatty matter, the buffy coat of inflamed blood. He believes that the protein of the food reaches the right side of the heart, circulates through the lungs, and combines with oxygen, forming oxy-protein (binoxide, tritoxide, or both); this reaches the nutrient capillaries, and all or part is decomposed; the oxygen being employed for the disorganization of worn-out tissue, the protein thus de-oxidized being deposited to supply its place. If more protein is set free than is wanted for the growth of tissue, it passes unchanged into the veins, to be again oxidized in the lungs. The tritoxide of protein being soluble in water, is better enabled to traverse the minutest capillaries than if it existed merely diffused through the fluid containing it." 9.

The greater part of the remaining portion of this chapter is taken up with details respecting the physical properties (density, colour, and consistence) of the urine. He notices the proposed application of the polariscope to the detection of sugar in the urine; and observes that, *there are many practical difficulties in the application of the polarising power of urine to the detection of sugar, which will probably ever prevent its being generally employed.* In this opinion we quite concur.

Chap. II. *Chemical Physiology of the Urine.*—After making some general statements respecting the composition of the urine, Dr. Bird proceeds to examine individually each of the essential and important constituents of this secretion, pointing out its principal physical and chemical characters and its physiological and pathological origin.

In speaking of *urea*, he observes that the physiological origin of this substance is owing to the destructive assimilation of the tissues of the body.

"That urea is one of the products of this important process, and that it constitutes the mode in which the greatest portion of the nitrogenised elements are secreted, is unquestionable. In man and warm-blooded, carnivorous and omniverous mammalia, its quantity far exceeds that of uric acid; whilst, in carnivorous birds, serpents, and insects, the latter substance predominates, and often quite replaces the urea. Dr. Prout is inclined to believe that the urea is the peculiar product of the metamorphosis of gelatinous, and uric acid of albuminous structures. Liebig, on the other hand, considers that uric acid is the immediate product of the change in all nitrogenised tissues, and that urea is the secondary product, arising from the action of oxygen and water in the uric acid. The fact that in sea-birds and many insects the uric acid remains in the state of urate of ammonia, and does not become converted into urea, notwithstanding

all the conditions necessary on Liebig's views for this change exist, must cause this hypothesis to be received with great caution." 34.

The influence of food in modifying the quantity of urea in the urine has been clearly shown by the experiments of Dr. Lehmann made on himself. The mean number of grains of urea obtained from the urine in 24 hours is thus expressed:—

Diet.	Animal.	Vegetable.	Mixed.	Non-nitrogenised.
Urea in the urine of 24 hours.	819.2	346.5	500.5	237.1

"No one can avoid observing the great disproportion existing between the quantity of urea existing in Lehmann's urine, and that generally met with; the quantity secreted whilst confined to a strictly non-azotized diet, nearly equalling the normal proportion." 35.

These observations are exceedingly valuable, in a practical point of view. They suggest the important aid to be derived from attention to diet, in the treatment of the disease called by Dr. Willis *Azoturia*, but of which Dr. Bird takes no notice.

Of the mode in which *uric acid* exists in healthy urine, Dr. Bird takes the following view:—

"*Uric acid at the moment of separation from the blood, meets the double phosphate of soda and ammonia, derived from the food, and forms urate of ammonia evolving phosphoric acid, which thus produces the natural acid re-action of urine. If the whole bulk of the urine be to the urate of ammonia formed, not less than about* 2700 *to* 1, *the secretion will, at the ordinary temperature of the air, remain clear, but if the bulk of fluid be less, an amorphous deposit of the urate will occur. On the other hand, if an excess of uric acid be separated by the kidneys, it will act on the phosphate of soda of the double salt, and hence, on cooling, the urine will deposit a crystalline sediment of uric acid sand, very probably mixed with amorphous urate of ammonia, the latter usually forming a layer above the crystals, which always sink to the bottom of the vessel.*" 42.

Liebig ascribes the origin of uric acid to the chemical action of oxygen of the arterial blood on the protein tissues. The following equation shews the products of this reaction:—

$$\underset{\text{Protein.}}{C^{48}\,N^{6}\,H^{36}\,O^{14}} + \underset{\text{Oxygen.}}{O^{91}} = \underset{\text{Uric Acid.}}{1\tfrac{1}{2}\,(C^{10}\,N^{4}\,H^{4}\,O^{6})} + \underset{\text{Carbonic Acid.}}{33\,(CO^{2})} + \underset{\text{Water.}}{30\,(HO.)}$$

Dr. Bird rejects, and very properly as we conceive, Liebig's hypothesis, and he observes that—

"If these views be correct, it will follow that, other things being equal, the proportion of uric acid in the urine will increase in the urine of a man who takes food rich in carbon, and decrease if he confines himself to a nitrogenised diet, thus becoming a carniverous animal. Further, the proportion of uric acid will decrease and urea increase, with the perfection of respiration and abundance of blood-discs, the reputed carriers of oxygen.

"It appears to me, however, that these views, ingenious and full of interest as they are, are not supported by any experience hitherto recorded, in fact, are, in many cases, totally opposed by it. The experiments of Lehmann, already

alluded to, performed upon himself, demonstrate that vegetable diet and one quite free from nitrogen decreases, and an animal diet increases, the quantity of uric acid; the urea also increases in the same manner. The following table presents the results of Lehmann on himself:—

DIET.	Quantity excreted in 24 hours of		Proportion of Uric Acid to Urea.
	URIC ACID.	UREA.	
Exclusively animal	22.64 grs.	819.2 grs.	1 : 36.1
Mixed animal and vegetable	18.17 ..	500.5	1 : 27.5
Exclusively vegetable	15.7 ..	346.5	1 : 22.
Food free from nitrogen ..	11.24 ..	237.1	1 : 21.

Hippuric Acid has only recently been satisfactorily shewn to constitute an ingredient of healthy urine. Its physiological origin is believed to be some of the non-azotized constituents of the food; and in proof of this Dr. Bird mentions a curious fact communicated to him by Liebig. A girl, labouring under what appears to have been some form of hysteria, refused all food, excepting apples, of which she devoured an enormous quantity. On examining her urine, it was found to be alkaline, and contained a large quantity of hippuric, but no uric acid, like the urine of a horse or cow.

By the use of either benzoic or cinnamic acid the quantity of hippuric acid is greatly augmented; a fact for which we are indebted to Mr. Alexander Ure. Hippuric acid contains the elements of urea *plus* those of lactic acid or of sugar or starch; a fact first explained by Dr. Garrod.

Dr. Bird takes no notice of any connexion between an abnormal quantity of hippuric acid in the urine, and other symptoms of disease. We have reason to suspect, however, that some forms of dyspepsia are associated with an excess of hippuric acid.

Butyric acid has been found in diabetic urine. It is a well-known constituent of butter; and recently Pelouze and Gèlis have shown that it may be formed from sugar by the aid of a piece of casein or glutine to act as a ferment. It is obvious, therefore, that there are two possible sources of the butyric acid found in the urine, namely, butter taken as food, and a modified assimilation of sugar. Curiously enough, Dr. Bird only refers to the latter origin of it; totally omitting to suggest the more natural and obvious source of it, namely, the butter employed as food.

We have a particular reason for believing the probably dietetical origin of this acid. In some experiments which we have made on diabetic urine we succeeded in obtaining sugar from the urine, when, to the best of our belief, the patient's food contained neither sugar nor any substance known to contain or yield it; when, in fact, the diet was exclusively animal, without milk.

In reflecting on this, we were led to suspect the possible conversion of glycerine into sugar. Now our readers are probably aware that butter, as well as some other animal fats, are composed of fatty acids combined with

glycerine ; and the fact of the existence of one, at least, of the fatty acids (viz. butyric acid) in the urine of diabetic patients lends some support to our hypothesis.

The existence of *Lactic Acid and Lactate of Ammonia* in the urine, as at one time admitted, has been recently denied by Liebig. It would appear that the substance which has been mistaken for these bodies is weakly basic, and contains a very large quantity of nitrogen.

But very little is known of the pigments of the urine. The yellow colouring matter is perhaps *hæmaphaein*, which is also found in the blood. The red pigment of the urine is *purpurine* (called *uro-erethrine* by Simon,) which is sometimes confounded with murexid (purpurate of ammonia.)

The *phosphates* of the urine are derived either from the food or from the action of oxygen on those structures into which phosphorus enters as an essential constituent. The *sulphates* have a similar origin.

Dr. Bird concludes this chapter with a tabular view of urinary deposits.

" *Class* 1.—Deposits composed essentially of ingredients formed directly or indirectly from the metamorphosis of tissues, or from the organic elements of food.

Uric acid and urates.
Uric oxide
Oxalate of lime.
Cystine.

" *Class* 2.—Deposits composed of ingredients of inorganic origin ; including—

Phosphate of lime.
Ammonio-phosphate of magnesia.
Carbonate of lime.
Silicic acid.

" *Class* 3.—Highly coloured deposits (black or blue) of doubtful origin.

Cyanourine.
Melanourine.
Indigo.
Prussian blue.

" *Class* 4.—Deposits consisting of non-crystalline organic products ; including—

A. *Organised.*
Blood.
Pus,
Mucous.
Organic globules.
Epithelium.

B. *Non-organised.*
Milk.
Fatty matter.

C. *Possessing independent vitality.*
Spermatozoa.
Torulæ.
Vibriones."

A worse and more unphilosophical classification we have never met with ; the two first classes are founded on the *origin* of the deposits—the third class on their *colour*—and the fourth on their *external form !* Passing over the difficulty, in many cases, of determining the organic or inorganic origin of a deposit, it is obvious that Dr. Bird's two first classes

include the deposits arranged under the two latter ones! Are not the blue and black pigments of the urine and the blood formed from the metamorphosis of tissues or from the organic elements of food? If so, they are clearly referable to the first class. Are not cyanourine, indigo, (as found in the urine,) and melono urine "deposits consisting of non-crystalline organic products," and, therefore, referable to the fourth class? Moreover, in the subdivisions of the fourth class, Dr. Bird again evinces a complete ignorance of the principles of classification; for it is evident that, as he takes the presence or absence of organization as the basis of his subdivision, there can be but two orders; and it is obvious that all the deposits placed in his third subdivision are really referable to the first, seeing that all of them are organised.

Dr. Bird commences his work with some introductory remarks on the clinical examination of urine. As these are most concisely and neatly stated, and have, moreover considerable practical utility, we shall offer no apology for transferring them to our pages; and the present seems to be the most appropriate place for introducing them. We may premise that the urine examined should be an average specimen of that passed in the preceding twenty-four hours, or at least that resulting from the first act of emission after a night's rest.

"*A.—Urine without any visible deposit.*

"A piece of litmus paper should be immersed in the urine, which if acid, will change the blue colour of the paper to red. Should no change occur, a piece of reddened litmus paper must be dipped in, and if the secretion be alkaline, its blue colour will be restored; but if no change occur, the urine is neutral.

"Some of the urine should then be gently heated in a polished metallic spoon over a candle, or what is preferable, in a test-tube over a spirit-lamp, and if a white deposit occurs, albumen or earthy phosphates are present; the former, if a drop of nitric acid does not re-dissolve the deposit; the latter, if it does.

"If the urine be very highly coloured, and undergoes no change by boiling, the colouring matters of bile, BLOOD, or purpurine are present. To determine which, pour a thin layer of urine on the back of a white plate, and allow a few drops of nitric acid to fall in the centre; an immediate and rapidly ending play of colours, from green to red, will occur if bile, but no such change if purpurine alone, exists. Should the highly-coloured urine alter in colour or transparency by heat, the presence of blood must be suspected.

"If the addition of nitric acid to deep red urine, unaffected by heat, produces a brown deposit, an excess of uric acid exists. If the urine be pale, immerse the gravimeter, and if the specific gravity be below 1.012, an excess of water exists in the urine, but if above 1.025, the presence of sugar, or excess of urea is indicated. To determine which, place a few drops in a watch-glass, and an equal quantity of nitric acid, and allow the glass to float on some cold water; crystallization of nitrate of urea will occur in two or three minutes, if the latter exists in excess. Should this change not occur, the urine must be examined specially for sugar, which, it must be remembered, may exist in small quantities, without raising the specific gravity of the fluid.

"Should the urine be alkaline, add a drop of nitric acid; if a white deposit occurs, albumen is present; if brisk effervescence follows the addition of the acid, the urea has been converted into carbonate of ammonia.

"*B.—Urine depositing a visible sediment.*

"If the deposit is flocculent, easily diffused on agitation, and scanty, not dis-

appearing on the addition of nitric acid, it is chiefly made up of healthy mucus, epithelium, or in women, an admixture of leucorrhœal discharge.

"If the deposit is ropy and apparently viscid, add a drop of nitric acid; if it wholly or partly dissolves, it is composed of phosphates; if but slightly affected, of mucus. If the deposit falls like a creamy layer to the bottom of the vessel, the supernatant urine being coagulable by heat, it consists of pus.

"If the deposit is white, it consists of urate of ammonia, phosphates, or cystine; the first disappears on heating the urine, the second on the addition of a drop of diluted nitric acid, whilst the third dissolves in ammonia, and the urine generally evolves an odour of sweet-briar.

"If the deposit be coloured, it consists of red particles of blood, uric acid, or urate of ammonia, stained with purpurine. If the first, the urine becomes opake by heat; if the second, the deposit is in visible crystals; if the third, the deposit is amorphous, and dissolves on heating the fluid.

"Oxalate of lime is often present diffused through urine, without forming a visible deposit; if this be suspected, a drop of the urine examined microscopically will detect the characteristic crystals.

"Much of the little time required for the investigation thus sketched out, may be saved by remembering the following facts:—

"If the deposit be white, and the urine acid, it in the great majority of cases consists of urate of ammonia; but should it not disappear by heat, it is phosphatic.

"If a deposit be of any colour inclining to yellow, drab, pink, or red, it is almost sure to be urate of ammonia, unless visibly crystalline, in which case it consists of uric acid.

"The only apparatus and re-agents required for these investigations at the bedside are—

"A gravimeter, made small enough to float in an ounce of fluid.

"Red and blue litmus paper.

"A test-tube and watch-glass.

"Nitric acid.

"All these are readily arranged in a little case, and can thus be always at the convenience of the practitioner. For the microscopic examination of the urine, a vertical instrument on a firm tripod stand, and large ring-stage, provided with a good half-inch achromatic object-glass, is alone required.

"The following table briefly points out the best mode for the analytical examination of saline deposits, either by chemical tests or the microscope. The latter mode of investigation is infinitely preferable to all others, both for accuracy and economy of time, but is of course not readily available in the sick-room.

A.—A Table for discovering the nature of saline deposits by chemical re-agents.

1.	Deposit, white - - - - -	2.
	——— coloured - - - -	5.
2.	——— dissolves by heat - - -	Urate of ammonia.
	——— insoluble by heat - - -	3.
3.	——— soluble in liquor ammoniæ -	Cystine.
	——— insoluble in - - - -	4.
4.	——— soluble in acetic acid - -	Earthy phosphates.
	——— insoluble - - - -	Oxalate of lime.
5.	——— visibly crystalline - - -	Uric acid.
	——— amorphous - - - -	6.
6.	——— readily soluble by heat - -	Urates.
	——— slowly dissolves by heat - -	——— stained by purpurine.

B.—Table for determining the nature of saline deposits by the microscope.

1.	Deposit, white - - - - -	2.
	——— coloured - - - -	5.
2.	——— an amorphous powder - -	Insoluble by heat—Phosphate of lime. Soluble by heat—Urate of ammonia.
	——— in defined crystals - -	3.
3.	——— in prismatic crystals - -	Triple phosphate.
	——— in octohedral or tubular crystals	4.
4.	——— in octohedra - - - -	Oxalate of lime.
	——— in simple or compound tables -	Cystine.
5.	——— in transparent crystals - -	Uric acid.
	——— amorphous, or in spherical masses	Urates of ammonia or soda."

On these directions we have to observe that they contain one very remarkable (typographical?) error. Dr. Bird states that, "if the urine be very highly coloured, and undergoes no change by boiling, the colouring matters of bile, *blood*, or purpurine are present." The statement is correct as regards bile and purpurine, but not with respect to blood; for it is well known, as Dr. Bird himself subsequently states, that bloody urine alters both in colour and transparency by heat. Moreover, the headings of these two tables are incorrect; for Dr. Bird cannot mean to assert that either *Uric acid* or *Cystine* are "saline" substances.

Chap. III.—*Chemical Pathology of Uric Acid and its Combinations.*—In this chapter Dr. Bird examines deposits of Uric Acid, Urate of Ammonia, and Urate of Soda.

The first of these, viz., *Uric Acid*, invariably occurs in a crystalline form, though under some considerable variety of shapes, all referable, however, to modifications of the rhombic prism, which may be assumed to be the normal crystalline form of this acid. The crystals are never colourless, but always present some tint of yellow or red. They do not dissolve when heated in the urine, but are soluble in liquor potassæ as well as in nitric acid; and the nitric solution yields by evaporation, a pink residue constituting the *murexid* of Liebig, the *purpurate of ammonia* of Prout.

Urate of Ammonia is amorphous, and may be white or coloured (yellow, red, pink, or purplish.) It does not appear in the urine until this liquid is cooled, and instantly disappears on the application of heat.

Urate of Soda occurs in gout, and in the urine of persons labouring under fever who have been treated with carbonate of soda. It does not disappear so readily as urate of ammonia, on the application of heat. When examined by the microscope it is found to consist of mixed yellowish masses provided with projecting, generally curved processes.

In discussing the pathological changes in the quantity of uric acid and urate of ammonia, Dr. Bird observes that—

"Excluding all abstract theories, whenever an excess of uric acid or its combinations with bases occurs in the urine, a normal quantity of water being present

(30 to 40 ounces in twenty-four hours,) it may safely be inferred that one or other of the following states exist:—

A. Waste of tissue more rapid than the supply of nitrogenized nourishment as in	Fever, acute inflammation, rheumatic inflammation, phthisis.
B. Supply of nitrogen in the food greater than is required for the reparation and supply of tissue, as in	Excessive indulgence in animal food, or the quantity of food remaining the same, with too little bodily exercise.
C. Supply of nitrogenized food not being in excess, but the digestive functions unable to assimilate it.	All the grades of dyspepsia.
D. The cutaneous outlet for nitrogenized excreta being obstructed, the kidney is called upon to compensate for this deficient function.	All or most stages of diseases attended with arrest of perspiration.
E. Congestions of the kidneys produced by local causes.	Blows and strains of the loins, diseases of genital apparatus.

Dr. Bird combats Liebig's hypothetical notions of the origin of an excess of uric acid.

"Professor Liebig recognizes one great cause of the appearance of an excess of uric acid in the urine, founded on his theoretical views of the conversion of this substance into urea. It may be thus briefly enunciated, that as normally the insoluble uric acid first produced by the metamorphosis of tissues is, under the influence of oxygen conveyed in the red blood-discs, converted into soluble urea, whatever increases the number of blood discs, or carriers of oxygen, or quickens the circulation, must cause the more complete conversion of uric acid into urea; and less of the former and more of the latter will appear in the urine. Conversely, whatever interferes with the perfection of oxygenation in the body, must necessarily produce an excess of uric acid. From this view, it follows that the quantity of uric acid ought to be positively or relatively to urea, decreased in

1. Fever.
2. Acute Phlegmasiæ.
3. Phthisis.

"And conversely, it should be increased in

1. Chlorosis.
2. Anæmia.
3. Pulmonary emphysema.

"The only mode of testing hypotheses of this kind emanating from a great and respected authority, is by clinical observation; and, so far as recorded facts are concerned, they fail altogether to give the slightest support to the ingenious theory of Professor Liebig.

"The labours of Edmund Becquerel in urinary pathology, furnish us with a mass of carefully recorded observations, which, made with no view of supporting or disputing any preconceived notions, are peculiarly entitled to respect. The numbers in the following table are calculated from some of the analyses alluded to, and point out the actual quantity of uric acid and urea excreted in the twenty-four hours, and the relative proportion they bear to each other, in several diseases.

	Quantity in 24 hours of		Ratio of uric acid to urea.
	Uric acid	Urea.	
	Grains.	Grains.	
Healthy urine (Becquerel's average)	8.1	255.	1 : 31.48
Chlorosis, minimum of five cases	1.8	77.5	1 : 43.
Chlorosis, maximum of five cases	6.	172.	1 : 29.
Pulmonary emphysema, extreme dyspnœa	4.9	172.	1 : 35.1
Phthisis, tubercles softened	9.1	66.7	1 : 7.33
Phthisis, three days before death	9.8	29.4	1 : 3.
Morbus cordis, with icterus	9.82	73.3	1 : 7.6
Acute hepatitis, with icterus	11.18	61.6	1 : 5.6
Icterus	17 75	285.6	1 : 16.1
Milk fever	19.	133.	1 : 7.47

"From this table, we find that in chlorosis, a disease of anæmia, in which oxygenation of the blood, on the theory of Liebig, must be most imperfect; the uric acid, instead of being in excess, is positively and relatively below rather than above the healthy average. In pulmonary emphysema again, the same thing is observed, although, from the want of integrity in the function of respiration, uric acid ought to abound; whilst in acute hepatitis, and in phthisis, diseases in which, on Liebig's own showing, excessive oxygenization is going on, the uric acid, both abstractly and in relation to the urea, is at a minimum instead of a maximum. On this account, as well as for the reasons already alluded to, the theory of Liebig must, in the present state of knowledge, be deemed unsatisfactory." 81.

Of the medical treatment of the different forms of uric acid gravel, our author observes, that—

"Discarding altogether the existence of any specific agent for a disease which is rather symptomatic of another affection than really idiopathic, the therapeutical agents may be briefly referred to the following heads:—

"1. *Attention to the function of the skin.*—The remarks already made on the effect of an arrest of perspiration furnishing a pabulum for the formation of a deposit, or by retaining in the circulation a substance capable of rendering uric acid insoluble, show the necessity of attending to this indication. I have repeatedly seen diaphoretics, warm clothing, the use of a flannel, and in winter, even a chamois-leather waistcoat, with friction by means of a flesh-brush or hair-glove, repeatedly remove a deposit of uric acid gravel, and in more than one instance, where even an hereditary taint existed from gouty or calculous progenitors." 90.

"My own experience induces me to regard the warm, or still better, the vapour bath, as the most valuable diaphoretic. The latter is readily employed in private practice by means of a very convenient and portable apparatus of M. Duval, which has for a long time superceded other forms of vapour-bath at Guy's Hospital. Actual diaphoresis is by no means necessary in the treatment of all cases of uric gravel; friction to the skin, and when persons are sufficiently robust, immersion in the cold-bath, followed by rubbing the surface of the body with a dry and rough towel, until reaction is produced, is often of great service.

"*Restoring the tone of the organs of digestion.*—By effecting this, a double object is attained; the perfection of the primary assimilation of the food by which the entrance of a crude nitrogenized matter, capable of being converted

into uric acid, into the blood is prevented, and the prevention of the generation of any acid, the product of unhealthy digestion, which might be absorbed by the lacteals, and act as a precipitant of uric acid. This part of the treatment of calculous affections must be modified by the peculiarities of the case, and indeed is identical with that of the different forms of dyspepsia. Careful attention to the bowels, avoiding excessive purging, the use of minute doses of mercury, as of a grain of pil. hydrargyri or hydrarg. c. creta, with thrice that quantity of ext. conii, administered two or three times a day, with moderate doses of the carbonates of potassa or soda in the mist. gentianæ comp., if constipation exists, or in inf. calumbæ, or what is far better, from its action on the skin, inf. serpentariæ, will often effect immense relief. Where gastrodynia, with or without pyrosis, exists, the use of half a grain of argenti nitras, or one of argenti oxydum, immediately before a meal, will often check alike the gastric and renal symptoms. But the most important element in the treatment is a rigid attention to the quality and quantity of the ingesta, taking the utmost care to select those articles of diet which the patient can best digest, it being of far greater importance, in the majority of cases, to regard this, than to choose articles of food according to their chemical composition. A too bulky meal of animal or vegetable food is injurious to persons labouring under calculous dyspepsia, for whilst the former supplies too much nitrogen, both will become sources of mischief by overloading the digestive functions, and preventing the chylopoietic viscera doing their duty. In protracted cases, however, much good is derived by actually cutting off part of the supply of nitrogen. In this way I have seen a copious deposit of uric acid gravel disappear, after other measures had failed to give relief." 92.

"Moderate muscular exertion, and a due amount of exercise is quite essential in the treatment of this disease; for not only do they call into play some very important functions, but often improve the general health. Besides this, when the stomach is imperfectly able to digest nitrogenized food, exercise will often aid its assimilation by making a call upon the chylopoietic organ for supply for the want of tissue it produces.

"Among the remedies which appear most successful when the food is not converted into healthy chyle, and an unhealthy state of the blood from the presence of imperfectly assimilated matters results, the preparations of iron deserves notice. I have repeatedly seen copious deposits of uric acid in persons of low power completely disappear *pari passu* with the cure of the pseudo-chlorotic symptoms present, by the use of this important drug. The best mode of administering it, is in combination with a vegetable acid, as the stomach bears it well in this form, and it is probably more likely to enter the circulation. From six to twelve grains of the ammonio-citrate or ammonio-tartrate of iron taken thrice a day immediately after a meal in a glass of water, have been most successful. The solution of the sesqui-acetate of iron is also a very valuable preparation, but is often inconvenient to prescribe, in consequence of its not being of constant strength." 95.

Dr. Bird then proceeds to notice remedies which act as solvents of uric acid; and successively passes under review alkalis and their carbonates, biborate and phosphate of soda, benzoic and cinnamic acid.

"As the alkaline urates are far more soluble than the free acid, the employment of soda and potass with their carbonates has been long used in the treatment of uric gravel. They moreover exert a beneficial effect in neutralizing any free acid in the primæ viæ, and thus preventing a precipitant of uric acid reaching the kidneys. The liquor potassæ may be employed in doses of half a drachm thrice a day: it is best taken about an hour after a meal, and may be conveniently administered in a little bitter ale, which conceals much of its disagreeable flavour, or in any bland vehicle. The carbonates of potass and soda are however, far more agreeable, and perhaps more efficient remedies,—of these the bicarbonate of potass deserves the preference. It should be given thrice a

day in doses of ℈j. or ʒss. I think it appears to act best when taken in a glass of warm water. To make it more agreeable, I generally order, what I am accustomed to term to my patients, the artificial Vichy water, made by stirring ʒss. of bicarbonate of potass and gr. v. citric acid into a tumbler of lukewarm water. This mixture evolves enough carbonic acid to be 'sparkling,' and is generally taken with readiness.

"A very convenient mode of impregnating the urine with an alkali is to administer the potass or soda in combination with a vegetable acid, especially with the acetic, citric, or tartaric. The mode in which these act is easily explained, when acetate, titrate, or tartrate of potass are ignited, the acid absorbs oxygen, and is converted into carbonic acid and water, part of the former uniting with the alkali. In a similar manner are these salts decomposed during the process of healthy digestion; a carbonate finds its way into the circulation, and reaching the kidneys, renders the urine alkaline. If, however, the digestive powers are impaired, the vegetable acid is only partly decomposed, and in some few persons it escapes the influence of digestion altogether. 114 grains of tartrate of potass, 106 of citrate, and 99 of the acetate, absorb respectively 40, 48, and 64 grains of oxygen, to be converted into carbonate of potass and water. These salts may be administered by directing the use of the common saline powders made with carbonates of potass or soda and the citric or tartaric acid in effervescence. When not contra-indicated, the use of strawberries, currents, and some other fruits containing alkaline citrates and malates, are capable of making the urine alkaline, and may be occasionally employed with advantage.

"Some persons cannot bear the use of free or carbonated alkalis without suffering severely in their general health, nor is their protracted use altogether without some ill effect. A flabby state of the muscles, and an anæmiated condition of the system, is frequently produced by the persistent use of alkaline remedies. Their injudicious employment may, as Dr. Prout has suggested, induce the formation of oxalic acid.

"Uric acid is soluble in a solution of borax, the biborate of soda,—more so, indeed, than in alkaline carbonates; and this salt may be taken for some time, at least by male patients, without producing any very injurious constitutional effects, and readily finds its way into the urine. On this account its administration has been suggested in cases of uric acid gravel, but it has not been much employed in this country. In women this drug cannot be employed with impunity, as it certainly exerts a stimulant action on the uterus, and I have seen it in two instances produce abortion.

"The remarkable solvent action of phosphate of soda on uric acid, to which Liebig has lately directed attention inspires a hope that its administration might be of use in cases of calculous disease, by impregnating the urine with an active solvent. All that is required to ensure this drug reaching the urine is to administer it in solution sufficiently diluted; ℈j. to ʒss. might be administered in any vehicle, as in broth or gruel, as when diluted, the phosphate tastes like common salt, and few persons object to its flavour. I have administered this drug in two very chronic cases of uric acid gravel, and in one with the effect of rapidly causing a disappearance of the deposit. This occurred in the person of a lady about forty years of age, who had, at my wish, for some weeks used the artificial Vichy water of the German Spa at Brighton without relief. The triple salt ammonia-phosphate of soda, would perhaps be a more active remedy than the simple phosphate, but its disagreeable flavour constitutes one objection to its employment.

"Much attention has been lately drawn to the effects of benzoic acid in preventing the formation of uric acid, by the observations of Mr. Alexander Ure. When this acid or its salts are administered, they are acted upon by the stomach in a very different manner from the other vegetable acids. Instead of be-

coming oxidized, and being converted into carbonic acid, it combines with those nitrogenized elements which would otherwise have formed urea or uric acid, and is converted into hippuric acid. It has been stated that the quantity of uric acid falls, when the benzoic acid is administered, below the average quantity, or even disappears from the urine. This has been, however, shown by Dr. Garrod, to be an error, and that urea alone disappears. Be this as it may, it is certain that the acid does appropriate to itself some body rich in nitrogen to form hippuric acid; and experience has shown that, in cases where an excess of uric acid is secreted, the administration of this drug appears to limit it to about the normal quantity." 99.

Chap. IV. *Chemical Pathology of Uric Oxide.*—Uric oxide, called by its discoverer, Dr. Marcet, *xanthic oxide*, is a very rare kind of calculus, which, in nearly all the recorded cases, has occurred in children. Its formula is $C^5 N^2 H^2 O^2$. Concretions formed of it resemble those of uric acid, but their sections are characterized by a well-marked salmon or rather cinnamon tint. Uric oxide is distinguished from uric acid by its insolubility in a solution of carbonate of potash; by its dissolving in nitric acid with little or no effervescence; by its nitric solution having on evaporation a yellow residue; by its not being precipitated from its solution in strong sulphuric acid by the addition of water; and by some other less important characteristics. No crystalline arrangement of its parts can be detected by the microscope. The character of the urine depositing it, as well as the pathological and therapeutical indications derived from it, are entirely unknown; though Dr. Bird thinks that, from its remarkable similarity in composition to uric acid, the majority of the remarks made on the pathology of this acid might be applied to that of the oxide.

Chap. V. *Chemical Pathology of Purpurine.*—Purpurine, called by Simon *uro-erethrine*, is one of the colouring matters of the healthy urine. It must not be confounded with *murexid* (the purpurate of ammonia of Prout.) On account of its solubility in water, it never occurs as a deposit unless urate of ammonia be present, when this salt, in precipitating from urine, carries with it the great mass of purpurine, and in consequence acquires a more or less deep carmine tint. The deposit, which is amorphous, yields up its purpurine to alcohol. This would distinguish it from blood, with which it has sometimes been confounded. Moreover, alcohol is without action on murexid. The presence of purpurine in urine is best detected by adding a little hydrochloric acid to some of the urine previously warmed; a colour varying from lilac to purple, according to the quantity of colouring matter present, immediately occurs.

On evaporating urine containing purpurine to the consistence of an extract, and digesting it in alcohol, a fine purple tincture is obtained, the intensity of the tint being rather heightened by acids and diminished by alkalis.

Dr. Bird's observations on the pathological indications of purpurine are too valuable to be condensed, and we shall therefore give them entire:—

"The presence of an excess of purpurine is almost invariably connected with some functional or organic mischief of the liver, spleen, or some other organ connected with the portal circulation. The appearance of a flesh-coloured deposit in the urine is the commonest accompaniment of even slight derangement

of the hepatic function, as every case of dyspepsia occurring in gin-drinkers points out. The intensity of colour of the deposit appears to be nearly in relation with the magnitude of the existing disease. In the malignantly diseased, in the contracted, hobnail, or cirrhosed liver, the pink deposits are almost constantly present in the urine. They also are of frequent occurrence in the hypertrophy of the spleen following ague. The most beautifully coloured deposits I have seen have occurred in ascites connected with organic disease of the liver; and I think I have received some assistance in the diagnosis between dropsy depending upon hepatic and peritoneal disease, in the presence of the pink deposits in the former, and their general absence in the latter. I have occasionally seen the deposits in question occur in phthisis, when large quantities of pus were poured out from vomicæ, as well as in deep-seated suppuration, as in psoas abscess. But even in these cases, the portal circulation is probably more or less influenced. My experience, indeed, leads me to express a firm belief that an excess of purpurine is almost pathognomonic of disease in the organs in which portal blood circulates." 110.

CHAP. VI. *Chemical Pathology of Cystine.*—Cystine, termed by its discoverer, Dr. Wollaston, *cystic oxide*, is distinguished from all other urinary concretions by the sulphur it contains, and which amounts to about 26 per cent. The formula for cystine is $C^6 H^6 NO^4 S^2$.

Calculi of cystic oxide are not laminated; but appear to form a mass confusedly crystallized throughout its substance. They are honey-yellow, semi-transparent, with a glistening lustre, somewhat like a confusedly crystallized mass of sugarcandy.

"Pure cystine is soluble in the mineral and insoluble in the vegetable acids; with the former it forms imperfect saline combinations, which generally leave by evaporation gummy masses or acicular crystals. It is readily soluble in ammonia and the fixed alkalis and their carbonates, but insoluble in carbonate of ammonia. Heated on platina-foil it burns, evolving a peculiar and disagreeable odour.

"A deposit of cystine may be distinguished from one of white urate of ammonia, by not disappearing on warming the urine, and from the earthy phosphates, by being insoluble in very dilute hydro-chloric or strong acetic acid. The best character of cystine is its ready solubility in ammonia, mere agitation of some of the deposit with liquor ammoniæ being sufficient to dissolve it, and a few drops of the fluid, when allowed to evaporate spontaneously on a slip of glass, leaves six-sided tables of cystine. The ammoniacal solution, when kept for some time in a white glass bottle, stains it black, from the combination of the sulphur of the cystine with the lead in the glass.

"Another test has been proposed by Liebig, founded on the presence of sulphur; he directs the deposit suspected to contain cystine to be dissolved in an alkaline solution of lead, made by adding liquor potassæ to a weak solution of acetate of lead until the oxide at first thrown down is re-dissolved. On heating the mixture, a black precipitate of sulphuret of lead appears if cystine be present. All sulphuretted animal matters similarly treated yield black precipitates, and hence this test is useless, if any portions of albuminous or mucous substances are mixed with the deposit to be examined." 113.

Our author thus describes urine which deposits cystine:—

"Most of the specimens of this variety of urine that I have met with, were pale yellow, presenting more of the honey-yellow than the usual amber tint of urine, not unfrequently possessing a somewhat oily appearance, like diabetic urine. The specific gravity of cystic urine is generally below the average, and

is sometimes passed in larger quantity than natural. In one case (a child,) in which Dr. Willis met with cystine, the urine was of a specific gravity of 1·030; but this is certainly unusual. It is often neutral, less frequently acid to litmus paper, but soon becomes alkaline by keeping.

"The odour of this form of urine is very peculiar, being in general a close resemblance to that of sweet-briar, and is sometimes rather powerful; less frequently the odour is fœtid, like putrid cabbage, owing, I suspect, to partial decomposition and evolution of sulphuretted hydrogen. In such specimens the colour has usually changed from pale yellow to green. In one case that occurred to me, the urine was actually of a bright apple green; it presented this tint for a few days, and the specimens subsequently voided were yellow." 114.

Cystine is very readily recognized by means of the microscope.

"When an ammoniacal solution of cystine is allowed to evaporate spontaneously on a piece of glass, it leaves crystals in the form of six-sided laminæ. These are probably exceedingly short hexagonal prisms. When the evaporation is slowly and carefully performed, these laminæ are transparent; but in general they are crystallized in a confused and irregular manner in the centre, the margins only being perfectly transparent. When examined by polarized light, these crystals, when sufficiently thin, present a beautiful series of tints, which are not observed when thick, on account of a high refracting power of cystine.

"When cystine occurs as a sediment, it is always crystallized, never under any circumstances being amorphous. Among the crystals, a few regular six-sided laminæ are often seen, but the great mass are composed of a large number of superposed plates, so that the compound crystals thus produced appear multangular, as if sharply crenate at the margin; and the whole surface is traversed by lines, which are really the edges of separate crystals. They thus resemble little white rosettes, when viewed by reflected light. These compound crystals always appear darker in the centre than at the circumference, which is sometimes quite transparent. Prisms of the triple phosphate are often mixed with the cystine, but on the addition of a few drops of acetic acid, they readily dissolve, leaving the rosettes of cystine unaffected." 117.

Dr. Bird agrees with Prout in referring cystine to an albuminous origin, and he observed that—

"Although but little is known of the pathological condition of the system which induces the formation of cystine, there is sufficient evidence before us to justify our expressing strong opinions of its essentially scrofulous and remarkable hereditary character. In one family alone, several members were nearly at the same time affected with cystine; and one instance exists in which it can be traced with tolerable certainty through three generations." 119.

In the treatment of cystine deposits the principal object to be attained is the improvement of the general health, and especially of the assimilative functions. To render the cystine, so long as it continues to be formed, soluble in the urine, nitro-hydrochloric acid has been recommended. Sea-bathing, exercise, nutritious and digestible diet, attention to the functions of the skin, and the use of iron, especially of the iodide, form Dr. Bird's principal measures for improving the general health.

Chap. VII. *Chemical Pathology of Oxalate of Lime* (*Oxaluria.*) Most of our readers are probably aware that to Dr. Bird is due the credit of having first shewn the comparative frequency of crystals of oxalate of lime in the urine; for, until the appearance of his researches on the subj

crystalline deposits of oxalate of lime were generally believed to be extremely rare. It is surprising how an error like this should have prevailed respecting a condition which Dr. Bird declares to be, with reference to this metropolis, of far more frequent occurrence than deposits of earthy phosphates. We feel indeed disposed to go a step beyond Dr. Bird, and to express our belief, founded on certain observations, that oxalate of lime deposits are not always to be regarded as evidence of morbid action.

The oxalic acid found in the urine can be derived from one or both of two sources only; viz. the food, or the metamorphosis of other bodies. Now we have reason to think that it is a much more frequent constituent of vegetable food than hitherto has been usually supposed; and being soluble, though indigestible, it readily enters the circulating mass, and is subsequently eliminated by the kidneys, in combination with a base. Curiously enough, Dr. Bird, in treating of the pathological origin of oxalate of lime, never once refers to the possible derivation of the acid of this salt from the aliment. He has drawn up a table to show us how readily the supply of earthy phosphates can be derived from without, yet when treating of oxalate of lime—a salt which he admits to be of far more frequent occurrence—he totally omits to notice its probable similar origin. He tells us that oxalate of lime is always greatest in quantity after a full meal; that it is often absent in the *urina sanguinis*, or that passed on rising in the morning; and that it disappears under the influence of a carefully regulated diet, and re-appears on returning to the use of unwholesome food. Yet it never once seems to have occurred to him that, in many at least of these cases, the oxalic acid might be, and probably was, a ready-formed constituent of the alimentary substances employed by the patient!

Now we have satisfied ourselves that crystals of oxalate of lime may be readily obtained from the urine of persons in perfect health, if they have partaken either of sorrel sauce, or of tarts or puddings made of the leaf-stalks of rhubarb. A friend of ours in Paris, who has devoted much of his time to microscopic investigations, under Gruby and Donné, tells us that when, for microscopical investigation, octohedral crystals of oxalate of lime were required, it was customary for himself and friends to dine off *fricandeau de veau à l'oseille;* and, in a few hours, an abundant supply of crystals was obtained. We mention this fact to shew with what facility oxalic acid may be obtained from healthy urine; and that we are not to assume, as Dr. Bird appears to do, that "certain definite aliments, all characterized by great nervous irritability," are necessarily connected with the occurrence of well-defined octohedral crystals of this salt in the urine.

We are indebted to the microscope for enabling us to discover the presence of oxalate of lime, not only in the urine, but also in the vegetable kingdom. It is well known that a distinguished English chemist submitted Russian rhubarb to a careful analysis, and failed to recognize the presence of oxalate of lime, although the microscope readily detects myriads of crystals of it; and an excellent microscopic observer (Mr. Edwin Quekett) has obtained from 100 grains of Russian rhubarb between 35 and 40 grains of this salt. If, then, oxalic acid be not frequently mentioned in the chemical analysis of esculent plants, it by no means follows that it is not a constituent of many of our vegetable foods; for, if present in small quan-

tities, or only at certain seasons, it may readily escape detection by chemical agents. In such cases, the microscope may be most advantageously resorted to, for the purpose of detecting, if they be present, crystals of oxalate of lime. Now Schleiden, a most distinguished botanist and microscopical observer, tells us, that "oxalate of lime is most universally diffused. In no plant," he adds, "does it appear to be entirely wanting; and in many it is found in enormous quantities."—(*Grundzüge der wissenschaftlichen Botanik*, 2te Aufl., 1845.)

In order to comprehend the cause of the frequent, if not universal, presence of oxalic acid in plants, we must remind our readers that a vegetable is an apparatus of reduction, in which carbonic acid and water are decomposed and oxygen evolved; and that from carbonic acid is derived the carbon of the various proximate principles of plants; such as the acids, fecula, gum, sugar, oil, &c. Now, it is probable, as Liebig (*Annalen der Chemie*, Bd. XLVI.) has hinted, that the production of oxalic acid may be the first step in the reduction of carbonic acid, and in the formation of other vegetable principles. If we suppose that, by the presence of a base, and through the action of light, 12 equivalents of carbonic acid lose a fourth part of their oxygen, in consequence of the vital power acting on their elements, oxalic acid will be formed.

$$C_{12}\,O^{24}—O_6 = C_{12}\,O_{18} = 6 \text{ eq. of anhydrous oxalic acid.}$$

But oxalic acid does not exist in the anhydrous state. The hydrated acid contains one equivalent of water. Hence,

$$C_{12}\,O_{18} + H_6\,O_6 = C_{12}\,H^6\,O_{24} = 6 \text{ eq. of hydrated oxalic acid.}$$

Now if, by the continued action of the same influences, a further quantity of oxygen be abstracted, the oxalic acid is converted into tartaric or malic acid: tartaric acid, if only 9 eq. of oxygen are abstracted; malic acid, if 12 eq. are removed.

$$\text{Hydrated oxalic acid, } C_{12}\,H_6\,O^{24}—O_9 = C_{12}\,H_6\,O_{15} = 3 \text{ eq. tartaric acid.}$$
$$\text{,, ,, ,, } C_{12}\,H_6\,O_{24}—O_{12} = C_{12}\,H_6\,O_{12} = 3 \text{ eq. malic acid.}$$

By the mere abstraction of the elements of water from the elements of malic acid we obtain citric and lichenic acids.

$$\text{Malic acid } C_{12}\,H_6\,O_{12} — HO = C_{12}\,H_5\,O_{11} = 3 \text{ eq. citric acid.}$$
$$\text{,, ,, } C_{12}\,H_6\,O_{12} — 3HO = C_{12}\,H_3\,O_9 = 3 \text{ eq. lichenic acid.}$$

We may regard tartaric, citric, and malic acids as combinations of oxalic acid with sugar, with gum, with woody fibre, or the elements of these.

$$\underset{\text{Tartaric Acid.}}{2\,(C_{12}\,H_6\,O_{15})} = \underset{\text{Oxalic Acid.}}{C_{12}\,O_{18}} + \underset{\text{Dry Grape Sugar.}}{C_{12}\,H_{12}\,O_{12}}.$$

By union with additional quantities of hydrogen (derived from the decomposition of water,) any of these acids may serve for the formation of sugar, starch, gum, and lignin.

We have entered into these considerations for the purpose of shewing the probably extensive agency of oxalic acid in the chemical phenomena of vegetation; and also of accounting for the very general diffusion of this acid over the vegetable kingdom.

But while, on the one hand, we are anxious to show that oxalic acid is

a constituent of most, if not of all plants,* and thereby to account for the by no means unfrequent occurrence of oxalate of lime in healthy urine, we beg to observe that there are many cases of disease in which the presence of sediments of oxalate of lime in the urine cannot be in this way accounted for; and in such we are obliged to admit that the acid has been generated in the system by some deranged condition of the assimilative process.

The formation of oxalic acid in the animal system is, however, due to changes of a reverse nature to those which originate this acid in plants. In the latter reducing, in the former oxidating, processes occur. In the vegetable, oxalic acid is formed by de-oxidation of carbonic acid; in the animal, it is produced by the oxidation of some carbonaceous compound.

"The ready conversion of uric into oxalic acid, under the influence of oxidizing agents, has been satisfactorily shown by Professors Liebig and Wohler; for when uric acid is heated with water and peroxide of lead, oxalic acid, carbonic acid, and allantoin, the peculiar ingredient of the allantoic fluid of the cow, are generated. The readiness with which, under certain circumstances, uric acid is converted into the oxalic, may be well illustrated by a fact which has been observed in connexion with the *guano* of South America, a substance now acquiring great celebrity as a manure. This contains, when recent, a considerable proportion of urate of ammonia, which salt, after a certain length of time, often during the voyage to this country, nearly wholly disappears, and is replaced by oxalate of ammonia." 139.

Dr. Bird gives the following directions for detecting the existence of oxalate of lime deposits:—

"To examine urine for the purpose of detecting the existence of the salt under consideration, allow a portion passed a few hours after a meal to repose in a glass vessel. Decant the upper 6-7ths of the urine, pour a portion of the remainder into a watch-glass, and gently warm it over a lamp; in a few seconds the heat will have rendered the fluid specifically lighter, and induced the deposition of the crystals of oxalate, if any were present: this may be hastened by gently moving the glass, so as to give the fluid a rotatory motion, which will collect the oxalate at the bottom of the capsule. The application of warmth serves, also, to remove the obscurity arising from the presence of urate of ammonia, which is readily dissolved by exposing urine containing it to a gentle heat. Having allowed the urine to repose for a minute or two, remove the greater portion of the fluid with a pipette, and replace it by distilled water. A white powder, often of a glistening appearance, will now become visible, and this, under a low magnifying power, as by placing the capsule under a microscope furnished with a half-inch object-glass, will be found to consist of crystals of oxalate of lime in beautifully-formed transparent octohedra, with sharply-defined edges, and angles." 125.

"The crystals of the oxalate, when collected in the manner above directed in a watch-glass, are unaltered by boiling either in acetic acid or solution of potass. In nitric acid they readily dissolve without effervescence. The solution may be very readily watched under the microscope. When the oxalate is allowed to dry on a plate of glass, and then examined, each crystal presents a very curious appearance, resembling two concentric cubes, with their angles and sides opposed, the inner one transparent, and the outer black, so that each resembles a trans-

* Oxalate of lime constitutes nearly 50 per cent. of some lichens. *Variolaria faginea*, for example, contains 47-4 per cent. In such instances we may consider this salt as forming the skeleton of the plant.

lucent cube set in a black frame. This is best observed under a half-inch object-glass; as with a higher power this appearance is lost.

"In a very few cases the oxalate is met with in very remarkable crystals, shaped like dumb-bells, or rather like two kidneys with their concavities opposed, and sometimes so closely approximating as to appear circular, the surfaces being finely striated. These crystals are produced, in all probability, by a prolific arrangement of minute acicular crystals." 127.

With respect to the characters of urine containing oxalate of lime, our author observes that—

"In the great majority of cases, the urine was of a fine amber hue, often darker than in health, but never presenting to my view an approach to the greenish tint described by Dr. Prout as characteristic of the secretion during the presence of what he has described as the oxalic diathesis, unless red particles of blood were present. In a few cases the urine was paler than natural; and then was always of lower specific gravity. This, however, was in most instances but a transient alteration, depending upon accidental causes. In many instances a deposit of urate of ammonia, occasionally tinted pink by purpurine, fell during cooling. This I observed to be infinitely more frequent during the months of January to March than in the three succeeding months of this year: hence it in all probability depended upon the influence of cold upon the cutaneous functions, thus causing a large amount of azote, under the form of the urate, to be excreted by the kidney. The specific gravity of oxalic urine varies extremely; in rather more than half the specimens being, however between 1·015 and 1·025. In eighty-five different specimens of which I have preserved notes, the ratio of the densities was as follows:—

In 9	specimens the	specific gravity ranged from	. .	1.009 : 1.015
In 27	ditto	ditto	. . . . . .	1.016 : 1.020
In 23	ditto	ditto	. . . . . .	1.021 : 1.025
In 26	ditto	ditto	. . . . . .	1.025 : 1.030

"Many of the specimens of oxalic urine gave a precipitate with salts of lime, insoluble in acetic acid, and consisting of oxalate of lime. This, in some instances at least, depended on the presence of oxalate of ammonia, and delicate acicular crystals of this salt occasionally formed upon the edge of the capsule by spontaneous evaporation.

"The acidity of these specimens was always well marked, often far more so than in health, and never being absent. I have not yet met with a single case in which an alkaline, or even positively neutral, state existed.

"A greater increase in the quantity of urea, than the density of the urine would have led us to suspect, was frequently found; indeed, I have scarcely met with a specimen in which, when the density was above 1.015, distinct indications of an excess of urea were not met with. In twenty-four of the eighty-five specimens above referred to, so large a quantity was present, that very rapid, and in some almost immediate, crystallization ensued on the addition of nitric acid. In general, in cases where the greatest excess of urea was present, the largest and most abundant crystals of the oxalate were detected." 131.

The following table shows the proportion of cases in which oxalate of lime was found complicated with other deposits:—

"Out of the eighty-five cases before referred to

Oxalate was present unmixed in	43 cases.
Mixed with urate ammonia in	15 "
Mixed with uric acid	15 "
Mixed with triple phosphate	4 "
Phosphate deposited by heat	8 "
	85

"In one of the specimens containing the triple phosphate, the application of heat produced a deposit of the earthy salts.

"One very constant phenomenon was observed in the microscopic examination of oxalic urine, viz., the presence of a very large quantity of epithelial scales; it was, indeed, the exception to the general rule to meet with this form of urine free from such an admixture. So constantly was it found, that repeatedly a white deposit of epithelium has often attracted my attention, and led to the suspicion of the probable presence of oxalate of lime." 132.

In no case has Dr. Bird detected sugar in urine containing oxalate of lime; and, therefore, the popular notion of the connection of this deposit with saccharine matter is unsupported by any evidence.

On the therapeutical indications for the treatment of oxaluria, Dr. Bird makes the following observations:—

"The treatment, in the majority of cases, is very successful; a few only resisting all the plans which were adopted. As a general rule, the functions of the body, where obviously imperfect, should be corrected, the general health attended to by the removal of all unnaturally exciting or depressing influences, the skin should be protected from sudden alternations of temperature by a flannel or woollen covering, and the diet carefully regulated. This has generally consisted of well-cooked digestible food, obtained in about equal proportions from the animal and vegetable kingdom; all things which tend to produce flatulence being carefully avoided. The drink should consist of water, or some bland fluid, beer and wine being excluded, especially the former, unless the patient's depression render such positively necessary. A very small quantity of brandy in a glass of water has generally appeared to be the most congenial beverage at the meals. The administration of nitric acid, as suggested by Dr. Prout; or what appeared to be preferable, the nitro-hydrochloric acid, in small doses, in some bitter infusion; or, laxative mixture, as the mistura gentianæ comp., was, with minute doses of mercury, generally successful, if continued a sufficient length of time. In cases where these failed, active tonics, especially the sulphate of zinc, and where the patient was anæmiated or chlorotic, the salts of iron in very large doses, appeared to be of great use, by subduing the irritable state of the nervous system. The shower bath, by acting in a similar manner, has been also of great service. There is one remedy which appears to exercise a marked influence over the characters of the urine, and which, from the small amount of experience I have had with it, seems to hold out the probability of its great utility in the disease under consideration: I allude to the colchicum, which, it is now generally admitted, exerts an immense influence over the organic system of nerves, and the functions under its control. The character of the urine is remarkably influenced by this drug, an excess of uric acid generally being present during its administration; and in two cases, in which oxalate of lime existed in abundance before its employment, uric acid appeared after a few days as a deposit, and nearly entirely replaced the oxalate; a circumstance generally observed during the successful treatment of this disease by other remedies. In no case have I seen the disease suddenly yield; it has generally slowly disappeared *pari passu* with the decrease in number and size of the crystals of the oxalate." 144.

If the views we have advocated be correct, a larger amount of animal food is indicated than Dr. Bird recommends.

Chap. VIII. *Chemical Pathology of the Earthy Salts.*—Under this head Dr. Bird examines deposits composed of phosphate of lime, ammonio-phosphate of magnesia, corbonate of lime, and silicic acid. The two latter substances are comparatively unimportant. Corbonate of lime some-

times occurs in small quantities in deposits of earthy phosphates when the urine is alkaline, and probably owes its origin to the decomposition of the earthy phosphate by carbonate of ammonia. Silicic acid is so rare that many writers doubt its existence in the urine.

Deposits of the earthy phosphates are always white, unless coloured with blood. They are soluble in hydrochloric acid and are insoluble in ammonia or liquor potassæ. Nor are they soluble in the urine by heat. Phosphate of lime occurs as an opake amorphous powder. The triple phosphate (phosphate of magnesia and ammonia) forms a crystalline deposit called *white gravel*. The neutral triple phosphate (HO, NH^4O, MgO, P^2O^5) occurs in prisms, stellæ, and penniform crystals. The prisms are well defined, with sharp and well defined angles and edges. The basic triple phosphate (NH^4O, $2 MgO$, P^2O^5) occurs in stellar and foliaceous crystals.

With respect to the pathological indications of the phosphates, Dr. Bird justly observes that—

"The occurrence of deposits of the earthy phosphates in the urine, must be regarded as of serious importance, always indicating the existence of important functional, and too frequently, even of organic mischief. One general law appears to govern the pathological development of these deposits, viz., that they always exist simultaneously with a depressed state of nervous energy, often general, more rarely local, in its seat. Of the former, the result of wear and tear of body and mind in old people, and of the latter the effects of local injury to the spine, will serve as examples. It is true that in the majority of these cases there is much irritability present, there is often an excited pulse, a tongue white on the surface and red at the margin and tip, with a dry, often imperspirable, occasionally hot skin. Still it is irritability with depression, a kind of erythism of the nervous system, if the expression be permitted, like that observed after considerable losses of blood." 176.

Our author recognizes at least four different pathological conditions connected with deposits of the earthy phosphates.

"A. Cases in which dyspepsia, with some febrile and nervous irritation, exists independently of any evidence of antecedent injury to the spine.

"B. Cases characterised by high nervous irritability, with a varying amount of marasmus, following a blow or other violence inflicted on the spine, but without paralysis.

"C. Cases in which the phosphatic urine co-exists with paraplegia, the results of spinal lesion.

"D. Cases of diseased mucous membrane of the bladder." 192.

The treatment of the first class of cases must be rather directed by general principles than limited to the solution of the phosphatic deposits.

"It is true that by the persistent administration of acids the deposit may disappear for a time, but the ailment goes on; all that is effected by such treatment is to mask a symptom, and an important one, of the progress of the malady. After having attended to the morale of the case, as far as possible rousing the patient from any morbid influence excited in his mind, whether real or imaginary; the next thing is to attend to the general health. The bowels should be freed from any unhealthy accumulation by a mild mercurial laxative, as a few grains of pil. hydrarg., followed by a dose of rhubarb or castor-oil; but all active purging should be avoided, as it generally aggravates the distress of the patient, and decidedly interferes with the success of the treatment. A combination of tonic-laxative with a sedative may then be administered, as tinct. hyoscyami et sp. ammon. aromatici āā ♏xx—ʒss. ex mist. gentianæ co. ℥j ter in die. If the

bowels be irritable, the inf. cascarillæ, or inf. serpentariæ, may be substituted for the mist. gentianæ comp. Should gastrodynia exist, great relief will be obtained by the administration of half a grain of oxyde of silver, made into a pill with confection of opium, before a meal. The diet should be very carefully regulated, all bland nutritious articles of food being preferred; vegetables should be avoided; and in general a small quantity of good sherry may be allowed. By a plan of treatment of this kind, the patients generally do well, and the phosphates and excess of urea vanish from the urine. As the patient approaches convalescence much good is often effected by the use of sulphate of zinc in gradually increasing doses, beginning with a grain thrice a day, made into a pill with a little ext. hyoscyami, or ext. gentianæ, and increasing the quantity every three or four days, until five grains or more are taken at a dose. Under the use of the zinc, I have seen many cases do well, whose symptoms approached in severity and character those of mild delirium tremens. I need hardly say that change of scene and occupation are important adjuvants to our medical treatment." 194.

The second class of cases are far less amenable to treatment.

"In these, the phosphatic deposit is often copious, and sometimes consists nearly exclusively of phosphate of lime; the lumbar pain and weight are considerable, the skin often dry and scarcely perspirable; in some cases, indeed, I have seen it look as if varnished; the tongue sometimes white, is often red; the thirst often great; indeed, the general appearance of the case closely resembles one of diabetes. The urine is generally more copious than natural, frequently pale, and of a specific gravity below the average. On investigating the patient's history, some evidence of a previous strain or wrench of the back, or a blow over the spine, is always elicited. These patients are seldom hypochondriacal; but intense irritability of temper, and a painfully anxious expression of countenance and manner, are almost invariably present.

"In the treatment of these cases, the great end and aim must be to subdue the morbidly irritable state of the brain and nervous system; and subsequently, by a generous diet and persistent use of those tonics which appear especially to exert their influence on the organic nerves, as silver, bismuth, zinc, &c., to endeavour to restore the assimilative functions to their due vigour. Besides the general indications to be fulfilled by regulated diet, amusements, exercise, &c., the use of narcotics, especially of opium, or the preparations of morphia, should be regarded as of the highest value; and we are indebted to Dr. Prout for first directing the attention of the Profession to their use." 199.

"Cases occasionally occur in which the symptoms are of a much milder character, but which insidiously go on to the formation of a calculus. It is in these in particular that the use of acids is called for, to hold the phosphatic salts in solution, and prevent their being moulded into a concretion in the pelvis of a kidney. Unfortunately there is a great uncertainty attending their use; sometimes the mineral acids appear to reach the urine and destroy its alkaline character; often, however, even their continued employment appears to be utterly ineffectual in rendering the urine acid. So far as I have watched cases of this kind, the nitric acid has appeared to produce the smallest amount of gastric derangement, and to render the urine acid, or at least diminish its alkaline re-action. In one case lately, in which the nitric acid could not be borne, the phosphoric appeared to succeed." 201.

In the third class of cases the deposition of the phosphates is a sure symptom of a grave and serious lesion, and must be treated according to the particular disease existing.

The fourth class of cases, or "those in which the phosphates are probably entirely secreted with unhealthy mucus by a diseased lining membrane of the bladder," are familiar to every practitioner.

"One point of great practical consequence must be borne in mind in forming a prognosis from the state of the urine, viz.. not to regard it as ammoniacal, because the odour is offensive; and not to consider the deposit as purulent because it looks so. A piece of litmus paper will often show the urine to be really acid, and microscopic inspection often proves that the puriform appearance of the urine is owing to abundance of phosphates with mucus. For want of these precautions I have seen one or two cases regarded as almost hopeless, which afterwards yielded to judicious treatment. It is quite certain that the mucous membrane of the bladder may, under the influence of chronic inflammation, secrete so much of the earthy phosphates and unhealthy mucus as to render the urine puriform and offensive without having necessarily undergone any structural change.

"A few cases have occurred to me in practice, in which the kind of urine just referred to was secreted for a long time, and yet yielded readily to treatment. In these, the greatest good has arisen from freeing the bladder from the phosphates which appear almost to incrust it, by acid injections. In this way cases have occasionally yielded which have quite defied all other treatment." 207.

In one case which Dr. Bird relates, great benefit was obtained by the daily careful injection of acidi hydrochlorici ♏x, with vini opii ♏xx. in barley-water.

Chap. IX. *Deposits of Black or Blue Colouring Matter.*—Exclusive of purpurine, and the colouring matters of the bile and blood, certain other pigmentary deposits, products of morbid action, are occasionally met with in the urine. Five of these are noticed by Dr. Bird; three of them are blue, and two are black. Of these the composition (which we subjoin) of two only has been ascertained.

Blue deposits....	Cyanourine. Indigo C^{16} NH^{5} O^{2} Prussian Blue Fe^{7} C^{18} N^{9} or Fe^{7} Cy^{9}
Black deposits . .	Melanourine. Melanic Acid.

A. *Blue Deposits.*—Blue urine was occasionally met with and noticed by the ancients; but its colouring principles have only been examined of late years.

Cyanourine, discovered by Braconnot, is a dark blue powder, which combines with acids, forming a solution which, when the acid is at the minimum is brown, when at a maximum, is of a magnificent carmine red. *Indigo* forms a deposit in the urine of epileptics who have been taking this colouring matter remedially. In some cases perhaps it may be generated in the system. It is soluble in oil of vitriol, and is bleached by chloride of soda. *Prussian blue* (called by Dr. Bird, who on this point adopts the erroneous nomenclature of the London Pharmacopœia, *percyanide of iron*) is sometimes artificially produced in the urine by giving to a patient who has been taking some preparations of iron, a few doses of ferrocyanide of potassium (yellow prussiate of potash.) Occasionally it is also met in the urine, in other cases, generally where iron has been employed. Liquor potassæ destroys the blue colour of Prussian blue, and yields a yellow solution which gives a blue precipitate with the sesqui-salts of iron, and reddish brown with the sulphate of copper. The pathological and thera-

peutical indications of the blue pigments of the urine are quite unknown.

We take this opportunity of stating that, we have reason to believe that the bluish green film, which is often seen covering the purulent secretion of indolent ulcers, and which stains the dressings green, contains Prussian blue.

B. *Black Deposits.*—Very little is known of the black deposits (*melanourine* and *melanic acid*) of the urine. We feel assured that, in some of those cases in which patients have been said to pass black urine, imposition has been practised on the medical attendant. One case occurred to ourselves. We had some black urine brought to us for examination by a medical friend, who told us it was evacuated by a young lady, and that the same was invariably passed after the patient had been cupped! On examination, we found the colouring matter to be ink; and the young lady ultimately confessed that, to deter her medical attendants from a repetition of the cupping, she had, on several occasions, emptied the ink-bottle into the chamber utensil.

In those cases in which black urine has been really secreted by the kidneys, it is probable that the pigment was some modification of the colouring matter of the blood. Nothing whatever is known of the pathological and therapeutical indications of black urine.

CHAP X. *Non-crystalline Organic Deposits.*—In this chapter Dr. Bird passes successively under review the following substances which occur in the urine: 1, the elements of blood; 2, purulent deposits; 3, *mucus*; 4, organic globules; 5, epithelium; 6, milk; 7, fatty matter; 8, spermatozoa; 9, torulæ; 10, vibriones. In the detection of these deposits microscopical examination is indispensable.

1. *Elements of Blood.*—Serum of the blood may occur in the urine either alone, as in Bright's disease, and in the anasarca which results from scarlatina,—or it may be accompanied by the red particles, as in cases of fungus hæmatodes of the kidneys. When the quantity of blood effused is large, it coagulates and forms masses like pieces of currant-jelly. Urine containing albumen becomes opaque by heat, as well as on the addition of nitric acid. The deposit stained by heat should not disappear on the addition of a few drops of nitric acid. This distinguishes albumen from the earthy deposits sometimes obtained by boiling urine. Pariset's test for the detection of hæmatosine is the following:—"Boil the urine and filter it. Brown coagula of hæmatosine and albumen will be left on the filter; pour on these liquor potassæ, and if hæmatosine be present, a greenish solution will pass through, from which hydrochloric acid will precipitate white coagula of protein."

After describing the microscopical characters of the blood-corpuscles, the author proceeds to notice the pathological and therapeutical indications of blood, or its elements in the urine. Our space prevents us from giving more than the following extract from this portion of our author's work:—

"No remedy has, however, appeared to me to be of such extraordinary value in the treatment of hæmaturia as gallic acid. I have seen this drug arrest for

many weeks bleeding from an enlarged (and fungoid?) kidney, after all other remedies had failed. It should be given in doses of five grains in a draught, with mucilage, and a little tinct. hyoscyami, and repeated at short intervals. This drug really acts as a direct astringent, reaching the capillaries of the kidney, and finding its way into the urine, which soon becomes so impregnated with it, as to be changed into ink on the addition of a few drops of tinctura ferri sesqui-chloridum." 234.

2. *Purulent Deposits.*—The occurrence of pus in the urine indicates the existence of suppurative inflammation in some parts of the urinary apparatus, and the treatment will of course depend upon the nature of the disease. The pus-globule is a nucleated cell larger than a blood disc, and floats in an albuminous liquor (*liquor puris*) not spontaneously coagulable.

3. *Mucus.*—Mucous particles are not distinguishable from the pus-globule, with which probably they are identical.

"Where mucus and pus essentially differ, is not in the nature of the particles, but in the fluid secreted with them, and in which they float; the *liquor puris* being albuminous and coagulable by heat, the *liquor muci* not being affected by it." 242.

Mucous deposits in general indicate irritation or inflammation of the genito-urinary mucous membrane; and the treatment must depend on the nature of the exciting cause.

3. *Organic Globules.*—Dr. Bird describes two of these. The *large* organic globule resembles the pus or mucous globule, but is unaccompanied with the characteristic albuminous fluid of pus, and with the glairy fluid of mucus. It has been found in every case of ardor urinæ. The *small* organic globule contains no traces of nucleus or traces of granulation. It is very rare. Dr. Bird found it in the urine of two women during menstruation.

4. *Epithelium.*—Epithelium-cells occur abundantly when deposits of oxalate of lime exist in the urine. They are regularly oval or irregularly angular flattened cells, and contain a well-marked central nucleus.

5. *Milk.*—Dr. Bird remarks that no satisfactory case is recorded, by any observer of credit, in which milk has been discovered in the urine. All the cases of milk-like urine, where no fraud has existed, are instances of phosphatic, purulent, or fatty urine. The pellicle which is found on the urine of pregnant, and probably also of suckling women, and which has been called *kiestein*, consists, according to Dr. Bird, of fat, (butter?) numerous crystals of triple phosphate, and an animal matter allied to, or identical with, casein, and which Dr. Stark has proposed to call *gravedine*.

6. *Fatty Matter.*—All the genuine specimens of fatty urine that have occurred to Dr. Bird have been opake, like diluted milk, and, in the majority of instances, have spontaneously gelatinized like so much blancmange, on cooling. To these the term *chylous urine* has been applied by Dr. Prout. By agitating the fresh urine with an equal bulk of ether in a

tube the fat is dissolved, and by repose a yellow ethereal solution of it will float on the top of the urine, which, by thus losing the fat, becomes nearly transparent. If the solution be decanted, and suffered to evaporate spontaneously in a watch-glass, a solid butter-like fat, having a rancid odour, is obtained. The urine also contains albumen [fibrin ?] in a spontaneously coagulable form. It occurs in patients who are disposed to obesity.

7. *Spermatozoa.*—If any of the spermatic secretion be present in urine it subsides, by repose, to the bottom of the vessel, and may be mistaken for mucus; but the microscope detects in it spermatozoa. Their presence of course proves that the seminal secretion must have been mixed *with* the urine, and often enables the physician to detect a source of exhaustion previously concealed from him.

8. *Torulæ.*—When saccharine urine is undergoing the vinous fermentation, very minute nucleated cells of an oval form are developed in it. After some time, articulated filaments make their appearance. All these different bodies, Dr. Bird includes under the denomination of *Torulæ*, though it is obvious enough to those who are familiar with these various structures, that they are not all referable to one genus; and in the figures which Dr. Bird has published, we detect two, if not three different species.

Dr. Bird observes that—

"The most trustworthy tests for the detection of sugar in urine depend *for their* action upon the reducing action of sugar on salts of copper, or upon the decomposition of the sugar by alkalis.

"1. *Trommer's Test.*—Add to the suspected urine in a large test-tube just enough of a solution of sulphate of copper, to communicate a faint blue tint. A slight deposit of phosphate of copper generally falls. Liquor potassæ must then be added in great excess; a precipitate of hydrated oxide of copper first falls, which re-dissolves in the excess of alkali, if sugar be present; forming a blue solution like ammoniuret of copper. On gently heating the mixture to ebullition, a deposit of red suboxide of copper falls if sugar be present.

"2. *Capezzuoli's Test.*—Add a few grains of blue hydrated oxide of copper to urine contained in a conical glass vessel, and render the whole alkaline by the addition of liquor potassæ. If sugar be present, the fluid assumes a reddish colour, and in a few hours the edge of the deposit of oxide assumes a yellow colour which gradually extends through the mass, from the reduction of the oxide to a metallic state (suboxide ?)

"3. *Moore's Test.*—This very easily applied test was lately proposed by Mr. Moore, of the Queen's Hospital, Birmingham, and depends for its action on the conversion of colourless diabetic (grape) sugar into brown melassic (or perhaps sacchulmic) acid under the influence of a caustic alkali. Place in a test-tube about two drams of the suspected urine, and add nearly half its bulk of liquor potassæ. Heat the whole over a spirit-lamp, and allow actual ebullition to continue for a minute or two; the previously pale urine will become of an orange-brown, or even bistre-tint, according to the proportion of sugar present. This test appears to be remarkably free from sources of fallacy, as boiling with liquor potassæ rather tends to bleach non-saccharine urine than to deepen its colour." 279.

Trommer states that by his test, grape sugar may be readily distin-

guished from cane sugar; and Dr. Ure (*Pharmaceutical Journal*, vol. ii. p. 12) has proposed it as a means of detecting the fraudulent adulteration of Muscovado sugar with potato-sugar. We have, however, found that it is quite inapplicable for this purpose; since the uncrystallizable cane sugar (treacle) contained in genuine Muscovado gives the same results as starch-sugar. Having some reason to suspect the applicability of Trommer's test to the detection of sugar in the urine, we resolved to subject Dr. Bird's "most trustworthy test" to careful examination.

For this purpose we provided ourselves with some urine which we believed to be healthy, and cautiously added to it, first a solution of sulphate of copper, and then excess of caustic potash, as directed by Dr. Bird. Instead of obtaining a precipitate of the hydrated oxide of copper, as his statement leads us to expect, we got "a blue solution like ammoniuret of copper," which, according to Dr. Bird, indicated the presence of sugar. The mixture was then heated to ebullition, when the blue colour disappeared, and a reddish deposit was formed, thus farther proving, according to Dr. Bird, the presence of sugar.

But as we had more confidence in the healthy quality of the urine under examination than in this "most trustworthy test," we made another experiment in elucidation of the preceding one. We dissolved some urate of ammonia (fæces of the boa constrictor) in warm water, and treated the solution as we had previously treated the urine: the same results were obtained. On the addition of excess of caustic potash, the urate of ammonia was decomposed; and the liberated ammonia combining with the oxide of copper formed a blue solution of ammoniuret of copper; and by ebullition, we obtained a red cupreous precipitate. We then collected some urate of ammonia from urine, dried it, dissolved it in water, and then subjected the solution to Trommer's test; the result was as before. We have, therefore, no hesitation in cautioning our readers against pinning their faith on Trommer's test for diabetic sugar, albeit Dr. Bird does call it a "most trustworthy test."

9. *Vibriones.*—Dr. Bird states that minute animalcules of the genus Vibrio (V. Lineola?) are sometimes developed in the urine, so soon after passing as to lead to the idea that their germs must have existed in the urine whist in the bladder. They have been found in abundance in cases of syphilitic cachexia and in mesenteric diseases.

Chap. XI. *Therapeutical Employment of Remedies influencing the Kidneys.*—In the eleventh and last chapter of his work, Dr. Bird examines the assumed capricious influence of diuretics, and lays down three "general laws" which regulate the action of these remedies.

"Law 1st. All therapeutical agents intended to reach the kidneys must either be in solution when administered, or capable of being dissolved in the fluids contained in the stomach or small intestines, after being swallowed. . .

"Law 2nd. Bodies intended to reach the kidneys must, to ensure their absorption, have their solutions so diluted as to be of considerably lower density than either the liquor sanguinis, or serum of blood.

"Law 3d. If a sufficient quantity of water cannot be received into the small intestines, or the circuit through the portal system in the vena-cava ascend

or thence through the lungs and heart into the systemic circulation, be obstructed, or if there be extensive disorganization of the kidneys, the due secretions of urine cannot be effected." 290.

To the enunciation of the first of these propositions, or "laws" as Dr. Bird calls them, no one can object; since the facts which it embraces have long been known and practically acted on. The second "law," however, is of a more hypothetical nature. It was first propounded by Liebig, and is founded on observation of the phenomena included under the denomination of endosmosis and exosmosis. When a piece of dead animal membrane is interposed between two liquids of unequal density, two opposite but unequal currents are established through the membrane; the stronger one in general flows from the lighter to the denser fluid; the weaker one, from the denser to the lighter fluid. The same phenomena are assumed to take place with living animal membrane; and, therefore, when saline substances are intended to act on the kidneys, they are recommended to be given in the form of solution, the density of which must be less than that of the serum of the blood; otherwise, instead of being absorbed, the solution will abstract liquid from the coats of the alimentary canal, and act as a hydragogue purgative. This application of the facts of endosmosis to the explanation of the diuretic and hydragogue action of saline substances is exceedingly ingenious and plausible; but must be received with considerable caution; as indeed should all physical and chemical explanations of the phenomena of living beings. It reduces the alimentary canal to the condition of a dead animal membrane; and supposes that the serum of the blood escapes through the parietes of the vessels; for it is certain that when two dissimilar fluids are separated by a dead membrane, *double* permeation is effected. Moreover, it overlooks one important fact, established by Dutrochet, namely, that in the case of certain liquids the stronger current is from the denser towards the lighter fluid.

Dr. Bird's third law is a proposition made by Dr. Barlow in the *Guy's Hospital Reports*, for October, 1844.

We shall conclude our observations on this chapter of Dr. Bird's work, by quoting his practical conclusions drawn from the laws above stated.

"1. Whenever it is desirable to impregnate the urine with a salt, or to excite diuresis by a saline combination, it must be exhibited in solution, so diluted as to contain less than five per cent. of the remedy, or not more than about twenty-five grains in an ordinary draught. The absorption of the drug into the capillaries will be ensured by a copious draught of water, or any diluent, immediately after each dose.

"2. When the urine contains purpurine, or other evidence of portal obstruction exist, the diuretics, or other remedies employed should be preceded or accompanied by the administration of mild mercurials—taraxacum, hydrochlorate of ammonia, or other cholitic remedies. By these means, or by local depletion, the portal vessels will be unloaded, and a free passage obtained to the general circulation.

"3. In cases of valvular or other obstructions existing in the heart and large vessels, it is next to useless to endeavour to excite diuretic action or appeal to the kidneys by remedies intended to be excreted by them. The best diuretics here will be found in whatever tends to diminish the congested state of the vascular system, and to moderate the action of the heart; as digitalis, colchicum, and other sedatives, with mild mercurials." 293.

In concluding our notice of Dr. Bird's book, our readers will expect from us a formal opinion of its merits and demerits. That we consider it an important work will be evident from the great space which we have devoted to its critical analysis. But it is disfigured by several blemishes. It appears to us to have been got up in a very hasty manner, and without time being allowed for the reading of the proof sheets. At least in no other way can we account for the numerous typographical and other errors which everywhere meet the eye. Our author is as unfortunate in spelling names and quoting books as the French writers proverbially are. With some words he seems to be undecided as to the proper etymology. Thus we have "octohedron" in one line, and "octahedron" in the next one. The French and German words are regularly murdered by him. He spells French words in German fashion, (ex. gr. "*chimie*" he writes "*chemie*,") while German words are spelled in French fashion, (ex. gr. "*de*" for "*der*." In the proper employment of capital and small letters gross errors are constantly committed. Thus in quoting the titles of German books, capital letters are frequently employed when they are inadmissible; and in quoting botanical names, the same errors are committed, (ex. gr. ***Pisum Sativum*** is put for ***Pisum sativum***; ***Phaseolus Vulgaris*** for ***Phaseolus vulgaris***.) The latter error is constantly made by persons unacquainted with the rules followed by botanical writers; but Dr. Bird, as a lecturer on Materia Medica, deserves reproof for this fault. At p. 146 a very serious error occurs, "℥" being substituted for "ʒ." ***One ounce of strong nitric acid, and one ounce of strong muriatic acid*** being ordered instead, we presume, of ***one drachm*** of each of these acids. We trust that in another edition of the work, (which we doubt not will be called for,) these and numerous other errors will be rectified.

Notwithstanding the blemishes which we have considered it our duty to notice, we conscientiously believe it to be a very useful work. It contains an excellent summary of what is known on the subject of which it treats; and we advise all our readers, who desire to be up to the present state of the chemical pathology of the kidney, and who wish to avail themselves of every practical novelty, to purchase it. It presents us with a clear, concise, and judicious exposition of the entire subject of urinary deposits, and should be in the library of every intelligent practitioner.

THE PHILOSOPHY OF THE MOVING POWERS OF THE BLOOD. By *G. Calvert Holland*, M.D., Physician Extraordinary to the Sheffield General Infirmary; formerly President of the Hunterian and Royal Physical Societies, Edinburgh, &c., &c. 8vo. pp. 308. London, Churchill, 1844.

THE title of this work is imposing, and it is probably owing to our expectations having been proportionally raised, that we have experienced some degree of disappointment in perusing it. Dr. Holland, in his preface, a

marks, that "to enforce truths a-head of the seeming necessities of the age, is to receive either the contempt or the persecution of mankind."

That men should closely scrutinize the evidence and reasoning by the force of which it is wished they should abandon opinions founded not upon mere authority, but upon investigations marked by talent and conducted with care, is not only natural but desirable; but that there is in the times in which we live any other disinclination beyond that stated to the reception of novel opinions and doctrines, we must take leave to doubt. However this may be, we can answer for ourselves that we have no special reverence for things because they are old, nor for names because they are high; and, therefore, we were quite prepared to abandon Harvey, Haller, Magendie, Müller, M. Hall, and the many other men of mark, who are arrayed together in Dr. Holland's table of "Contents" as propagators of error and fallacy, but upon one condition, that the author should afford us better reasons for our new belief than for our former faith, and to this limited extent we trust we may be permitted to retain our orthodoxy.

In the work before us, most of the experiments that have been performed of late years, relating to the powers which accomplish the circulation of the blood, are criticised with much minuteness; and although we feel ourselves called upon to dissent from many of the author's conclusions, it is right to state that several of the objections urged evince much penetration, and are well worthy of consideration.

A leading object with Dr. Holland is to show the insufficiency of the celebrated experiments of Magendie, by which that eminent physiologist endeavoured to prove that the power of the left ventricle of the heart operated not only in the propulsion of the arterial, but likewise of the venous blood. The principle of these experiments, as most of our readers are aware, was as follows: a ligature was applied round the thigh of a dog, excluding only the femoral artery and vein; the vein was then separately tied near the groin, and a slight puncture was made into this vessel; a considerable jet of blood flowed out, but upon pressing the artery between the fingers, although the jet continued for some instants, it soon stopped, notwithstanding the whole length of the vein was full; upon removing the pressure the jet was re-established, as soon as the blood, injected by the heart, had arrived at the last divisions of the arteries. Upon this experiment the author observes:—

"The cessation of the jet is no evidence that it arises from interruption to the influence of the heart. The same result would occur were the capillaries the cause of venous circulation. The stream flows as long as the capillaries receive blood. If none exist between the roots of the vein and the compressed artery, whence is the power to be derived to act on the contents of the vein?

"In the attempt to prove that the venous current is propelled by the heart alone, in common justice to the capillaries they ought not to be deprived of blood. It is unphilosophical to withhold this, by which they are stimulated to contraction, and then to accuse them of the want of power. Were the physiologist to prevent the blood flowing into the left auricle, and observing the arteries full to distension, to call attention to the fact, as evidence that the contents of these vessels were not at all influenced by the heart, the inference would naturally be objected to. But the capillaries are placed precisely in this situation. There is no difference between them and the heart in the case supposed. The artery, from which they receive their stimulus and source of contraction, is

empty, and, consequently, the supply is cut off. There is a column of blood in advance of them, but there is none, *à-tergo*, by which to act upon it." P. 171.

These objections to us are not satisfactory, for it cannot fairly be inferred from the account of the experiment that, although the main artery was seen to contract and thus to become empty, the vast plexus of small arteries and capillaries of the limb was also in a state of vacuity, and consequently that the latter vessels wanted the necessary condition of their assumed action, namely, the presence of blood. On the contrary, this and other similar experiments are more reasonably explained upon the assumption, that the vis-à-tergo afforded by the left ventricle is necessary to the venous circulation. The well-known fact, that if, in venæsection, the arm is bound up so tightly as to compress the brachial artery, after the first jet no blood will flow, although it is certain the limb is full of blood, is a strong corroboration of the truth of M. Magendie's deduction.

But there are others, and more decided proofs, that the heart's propulsive force can influence the veins. One of the most satisfactory of these is the occasional occurrence of a venous pulse, caused, not like the more ordinary one by a reflux of blood from the right auricle, but by a *vis-à-tergo*. M. Martin Solon has recently communicated some very instructive cases, (Bulletin de l'Acad. Roy. de Med. 1844, p. 102,) from which we extract the following particulars. One of these cases occurred in a young man, aged 23, the subject of pleuro-pneumonia on both sides: the pulse of the radial artery 110, full and strong; the impulse of the heart strong and energetic; the dorsal veins of the hands, which were prominent, rounded, and of a slightly blueish and rose colour, presented a movement of diastole and systole sensible to the sight and appreciable by the touch: these pulsatile motions were isochronous with the radial pulse; they ceased, and the veins diminished in volume, when pressure was made upon these vessels towards the fingers, whilst, on the contrary, the motions persisted when pressure was applied to the wrist; compression of the brachial artery also caused the pulsations to cease. Other and similar cases are related, and those of Dr. Ward (Medical Gazette, 1832, p. 376) and of Dr. Graves are quoted.

Dr. Ward, in the paper referred to, attributed this interesting phenomenon "to the excessive action of the heart, pushing the thin and impoverished blood through the capillaries straight on into the veins;" a view which is adopted by M. Solon, though we are sorry to say, without any reference to the earlier English observer. There can be no doubt that the causes assigned by Dr. Ward must be operative; but the obstruction à fronte to the free return of the venous blood, dependent upon the embarrassment of the pulmonary circulation, which we believe always exists in these cases, doubtless is an additional and a necessary condition.

But whatever may be the cause of this form of venous pulse, the latter is an unquestionable proof that the power of the heart can, under certain circumstances, influence the circulation in the veins.

Dr. Holland also calls in question the opinion of physiologists, resting upon the experiments of Poiseuille and other evidence, that the elasticity of the arteries is the main cause by which the periodic impulse of the heart is converted into a permanent force, and by which the current of the blood acquires the uniformity observed in the capillary vessels. The au-

thor remarks, "this experiment (Poiseuille's) proves that an artery, when greatly distended, as in this instance, is capable of re-acting on its contents; but no conclusion can be drawn from the fact in reference to the agency of elasticity in the circulation of the blood." In this, as on most other points, we do not agree with the writer, and for this, among other reasons because we do not think it probable that such a high degree of elasticity would have been conferred upon the arterial tunics, so great indeed as to have become proverbial, if it were not designed to perform some important office in the mechanism of the circulation.

Dr. Holland, in criticising the researches of Dr. M. Hall and others, objects with justice to conclusions being drawn concerning the nature of the capillary circulation, after great disturbance has been induced by the experiments themselves. If, for instance, a ligature be applied around the leg of a frog, what satisfactory results can be obtained when, on the one hand, the supply of blood through the arteries is cut off, and, on the other, the exit through the veins is totally obstructed? Herein, in fact, is comprised the essence of the author's charges against experimentalists: "the analysis has constantly presented to the mind two objections—an obstacle in advance of the capillaries, and an interruption to the supply from behind." P. 203.

As the following experiment is conceived by the writer to be free from all such difficulties, we give it in his own words:—

"It is not my intention to examine the phenomena of fœtal circulation, but to allude only to one striking peculiarity, viz., the circulation of the blood in the umbilical vein. This fluid is transmitted from the placenta to the fœtus without the aid of any propulsive organ. The capillaries are, indeed, the only source of motive power shown to exist, and hence, the placenta separated from the uterus, appeared capable of determining the influence of capillaries, in urging the blood through the long capacious vein. To test the fact, a placenta was procured, twenty minutes after separation from the uterus, and placed with the exception of the cord, in a bladder, which was immersed in water, at the temperature of 100° Fahrenheit. The free extremity of the cord, at the same moment, was elevated to an angle of 38°, resting on the edge of a glass, and at the distance of a foot from the placenta. At the commencement no blood escaped from the vein, but in two minutes from the immersion, it began to flow, and continued for about twenty minutes, and at this time, the glass had received above an ounce.

"Here, then, is an experiment unexceptionable in its character, demonstrating the power of the capillaries to carry on the circulation, not only in their complicated net-work of vessels, but in larger vessels, ultimately terminating in a capacious vein." P. 205.

In the correctness of the assertion that the experiment is "unexceptionable" we cannot concur; indeed, the author himself observes of it that "the disengagement of it (the placenta) from the uterus disturbs the normal relations of these vessels," that is the placental arteries, veins, and capillaries. It is rather surprising that Dr. Holland, who urges his "objections" somewhat unsparingly, should not have been more judicious in the selection of his own experiment, and particularly that he should not have guarded against "an interruption to the supply from hind." The oozing from the umbilical vein, for, as only an ounce was lected in twenty minutes, the escape of blood could have amounted to

nothing more, it may reasonably be inferred depended upon that gradual contraction of the arteries, which it has been distinctly shown by Hunter and many subsequent observers, those vessels possess, by which they are enabled to adapt themselves to the varying bulk of their contents. The great point which the author wishes to establish by the experiment we have detailed, and by his elaborate critiques, is that the capillary vessels, which he states, but erroneously, to be the seat of all the vital actions, assist by their contractility in the circulation.

Without dwelling longer upon this questio vexata, we will only state it is our conviction, that although the capillaries have distinct walls (we have seen them plainly with the microscope, as Schwann and Henle had before, in vessels taken from the pia mater and elsewhere), and although they possess a power of contraction, and especially a capability of becoming preternaturally dilated, yet that they do not aid in the normal circulation of the blood by any propulsive action.

Our limits will not allow us to follow the author in his criticisms relating to the circulation of the acardiac fœtus, which in themselves offer little that is novel. But we must remark in conclusion that, the ingenious experiment of Dr. M. Hall, in which, by placing a heavy probe upon the dorsal fin of the eel, he rendered the circulation in the capillaries *pulsatile*, and thus demonstrated that the single ventricle of the fish does operate through *two sets of capillary vessels*, the branchial and systemic, is an all-important element in this and similar inquiries, and is not liable to be set aside, notwithstanding Dr. Holland's "Objections."

A Thermometrical Table on the Scales of Fahrenheit, Centigrade, and Reaumur, &c. By *Alfred S. Taylor*, Lecturer on Chemistry, &c. London, 1845. T. and R. Willats.

We have received this exceedingly instructive "Thermometric Table," by Mr. Alfred Taylor, of Guy's Hospital. It contains a vast deal of information in little space. By its aid, not only can we read off at a glance the corresponding degrees of the three thermometers at present in use—Fahrenheit's, Reaumur's, and the Centigrade—but we also find out a host of interesting particulars connected with Climatology, Physical Geography, Chemistry, and Physiology. By having it at his side, the student will save himself no little time and trouble in the way of reference to different books.

Would that Mr. Taylor would give us, at his leisure, a similar table of weights and measures, British and Foreign; so that the reader of French and German works could at once reduce the one into the other.

MODERN COOKERY IN ALL ITS BRANCHES REDUCED TO A SYSTEM OF EASY PRACTICE, &c. By *Eliza Acton*. Longman and Co. 1845.

AMONG the revolutions and improvements that have taken place in medicine during the present century, the increased attention to DIETETICS is one of the most important and conspicuous. We seldom take physic except when we are ill; but we are always taking food, and many of our maladies are induced by improper diet. We strongly suspect that our augmented longevity is as much owing to food as to physic. Cookery, is therefore, not beneath the notice of the physician. A late celebrated—at least fashionable—physician owed much of his popularity to his readiness in prescribing a dish as well as a draught for his patient;—and a living physician, of high literary and scientific attainments, is not less indebted to his chemistry of the kitchen, than to his pharmaceutical knowledge, for the high station he now holds. A knowledge of the cuisine is more necessary to the medical man than to any other professional man. His constant intercourse with dyspeptics—hypochondriacs—invalids and convalescents, calls upon him daily and hourly for advice as to diet; and he finds no small difficulty in adapting the dish to the nature of the complaint and the habit of the individual. Many a convalescent would fall back and perish were not food furnished of a kind that will suit the languid appetite and the morbidly fastidious palate.

Although England has long taken the lead in arts, commerce, and manufactures, she has made slow advance in the noble science of gastronomy, and has generally called in the assistance of France and Italy in the mysterious chemical processes going on in the lower regions of *John Bull's* castle. There JOHNNY CRAPEAUD rules the roast, sending up, daily, to the master of the mansion a farrago of "dishes tortured from their native taste," sufficient to feed the whole brood of Proteian devils that prey upon the vitals of the family, and give unfailing occupation to the doctor, the apothecary, and the undertaker! Everybody knows that God sends food to mankind, but that the cooks come from a very different quarter. The young doctor, therefore, who has often a young wife, and still younger children, should know whether he has "death in the pot," as well as dumplings. Economy in cooking is equally important to the rising generation of our brethren, as economy in dress, house-rent, and equipage—perhaps more so. We cannot, therefore, too warmly commend to the notice of our junior brethren this compilation of Eliza Acton, which will prove as useful to young Mrs. and her cook in the kitchen, as Thomson's Dispensatory or Conspectus to the young doctor in the library.

MEDICAL REFORM.

REMARKS ON THE TRIPARTITE DIVISION OF MEDICINE. By *Michael Keating O'Shea.* Gilbert, 1845.

A BILL FOR REGULATING THE PROFESSION OF PHYSIC AND SURGERY. (Ordered to be Printed, Feb. 1845.)

THE APOTHECARIES' SOCIETY'S (2nd) ADDRESS TO THE GENERAL PRACTITIONERS ON THE NEW MEDICAL BILL, AS CONTRASTED WITH THE BILL OF LAST SESSION. Highley, 1845.

BEING among those who refused to join in an indiscriminate opposition to the former measure proposed by Sir James Graham, in the hope and belief that, when informed of the wishes and just expectations of the Profession, (whose opinion he stated himself so anxious to be placed in possession of,) that Minister would consent to such alterations and amendments as would render it a useful and satisfactory enactment, we deeply regret having to record the disappointment the perusal of the provisions of the new Bill has occasioned us. The General Practitioners neither can nor ought to feel contented with this reply to their just and reasonable demands. It is true the new measure was ushered in with a conciliatory speech on the part of its proposer, and a distinct recognition of the usefulness, importance, honourable conduct, and humane dispositions of this large class of society. But as we never believed that the former measure was introduced, as roundly stated by so many of its opponents, with the express intention of degrading the great mass of the Profession, so we are quite at a loss to perceive how the value of the present one is enhanced by an admission which we suppose any other member of the House of Commons would have made just as cheerfully. On the contrary, we see cause for discouragement in this. If Sir James Graham, while acknowledging the excellent qualities and vast usefulness of the General Practitioner, still withholds from him his most elementary rights, we can only come to the conclusion that he remains, after all the pains which have been taken to instruct him, hopelessly ignorant of what these are, or is prevented by some influence adverse to their recognition from doing justice to them. That the former element is not an inconsiderable one in determining his proceedings, we may judge from his astounding reply to a question asked him recently in the House, as to his intentions in regard to amending the Charter granted to the College of Surgeons. He stated, he was "at a loss to understand what were the grievances or exclusions his hon. friend's question referred to!" This, joined with the belief expressed in his speech that the good understanding between the governing powers and members of the College would shortly become augmented by the operation of this very charter, shows such a state of utter ignorance upon the very matter which has most excited the attention and dissatisfaction of the whole profession, that the expectation of its removal must be entertained by those only who are in possession of more sanguine temperaments than ourselves.

It is true the Minister stated he thought the General Practitioners ou*g*

tube the fat is dissolved, and by repose a yellow ethereal solution of it will float on the top of the urine, which, by thus losing the fat, becomes nearly transparent. If the solution be decanted, and suffered to evaporate spontaneously in a watch-glass, a solid butter-like fat, having a rancid odour, is obtained. The urine also contains albumen [fibrin ?] in a spontaneously coagulable form. It occurs in patients who are disposed to obesity.

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Dr. Bird observes that—

"The most trustworthy tests for the detection of sugar in urine depend *for their* action upon the reducing action of sugar on salts of copper, or upon the decomposition of the sugar by alkalis.

"1. *Trommer's Test.*—Add to the suspected urine in a large test-tube just enough of a solution of sulphate of copper, to communicate a faint blue tint. A slight deposit of phosphate of copper generally falls. Liquor potassæ must then be added in great excess; a precipitate of hydrated oxide of copper first falls, which re-dissolves in the excess of alkali, if sugar be present; forming a blue solution like ammoniuret of copper. On gently heating the mixture to ebullition, a deposit of red suboxide of copper falls if sugar be present.

"2. *Capezzuoli's Test.*—Add a few grains of blue hydrated oxide of copper to urine contained in a conical glass vessel, and render the whole alkaline by the addition of liquor potassæ. If sugar be present, the fluid assumes a reddish colour, and in a few hours the edge of the deposit of oxide assumes a yellow colour which gradually extends through the mass, from the reduction of the oxide to a metallic state (suboxide ?)

"3. *Moore's Test.*—This very easily applied test was lately proposed by Mr. Moore, of the Queen's Hospital, Birmingham, and depends for its action on the conversion of colourless diabetic (grape) sugar into brown melassic (or perhaps sacchulmic) acid under the influence of a caustic alkali. Place in a test-tube about two drams of the suspected urine, and add nearly half its bulk of liquor potassæ. Heat the whole over a spirit-lamp, and allow actual ebullition to continue for a minute or two; the previously pale urine will become of an orange-brown, or even bistre-tint, according to the proportion of sugar present. This test appears to be remarkably free from sources of fallacy, as boiling with liquor potassæ rather tends to bleach non-saccharine urine than to deepen its colour." 279.

Trommer states that by his test, grape sugar may be readily distin-

guished from cane sugar; and Dr. Ure (*Pharmaceutical Journal*, vol. ii. p. 12) has proposed it as a means of detecting the fraudulent adulteration of Muscovado sugar with potato-sugar. We have, however, found that it is quite inapplicable for this purpose; since the uncrystallizable cane sugar (treacle) contained in genuine Muscovado gives the same results as starch-sugar. Having some reason to suspect the applicability of Trommer's test to the detection of sugar in the urine, we resolved to subject Dr. Bird's "most trustworthy test" to careful examination.

For this purpose we provided ourselves with some urine which we believed to be healthy, and cautiously added to it, first a solution of sulphate of copper, and then excess of caustic potash, as directed by Dr. Bird. Instead of obtaining a precipitate of the hydrated oxide of copper, as his statement leads us to expect, we got "a blue solution like ammoniuret of copper," which, according to Dr. Bird, indicated the presence of sugar. The mixture was then heated to ebullition, when the blue colour disappeared, and a reddish deposit was formed, thus farther proving, according to Dr. Bird, the presence of sugar.

But as we had more confidence in the healthy quality of the urine under examination than in this "most trustworthy test," we made another experiment in elucidation of the preceding one. We dissolved some urate of ammonia (fæces of the boa constrictor) in warm water, and treated the solution as we had previously treated the urine: the same results were obtained. On the addition of excess of caustic potash, the urate of ammonia was decomposed; and the liberated ammonia combining with the oxide of copper formed a blue solution of ammoniuret of copper; and by ebullition, we obtained a red cupreous precipitate. We then collected some urate of ammonia from urine, dried it, dissolved it in water, and then subjected the solution to Trommer's test; the result was as before. We have, therefore, no hesitation in cautioning our readers against pinning their faith on Trommer's test for diabetic sugar, albeit Dr. Bird does call it a "most trustworthy test."

9. *Vibriones.*—Dr. Bird states that minute animalcules of the genus Vibrio (V. Lineola?) are sometimes developed in the urine, so soon after passing as to lead to the idea that their germs must have existed in the urine whist in the bladder. They have been found in abundance in cases of syphilitic cachexia and in mesenteric diseases.

Chap. XI. *Therapeutical Employment of Remedies influencing the Kidneys.*—In the eleventh and last chapter of his work, Dr. Bird examines the assumed capricious influence of diuretics, and lays down three "general laws" which regulate the action of these remedies.

"Law 1st. All therapeutical agents intended to reach the kidneys must either be in solution when administered, or capable of being dissolved in the fluids contained in the stomach or small intestines, after being swallowed.

"Law 2nd. Bodies intended to reach the kidneys must, to ensure their absorption, have their solutions so diluted as to be of considerably lower density than either the liquor sanguinis, or serum of blood.

"Law 3d. If a sufficient quantity of water cannot be received into the small intestines, or the circuit through the portal system in the vena-cava ascendens,

or thence through the lungs and heart into the systemic circulation, be obstructed, or if there be extensive disorganization of the kidneys, the due secretions of urine cannot be effected." 290.

To the enunciation of the first of these propositions, or "laws" as Dr. Bird calls them, no one can object; since the facts which it embraces have long been known and practically acted on. The second "law," however, is of a more hypothetical nature. It was first propounded by Liebig, and is founded on observation of the phenomena included under the denomination of endosmosis and exosmosis. When a piece of dead animal membrane is interposed between two liquids of unequal density, two opposite but unequal currents are established through the membrane; the stronger one in general flows from the lighter to the denser fluid; the weaker one, from the denser to the lighter fluid. The same phenomena are assumed to take place with living animal membrane; and, therefore, when saline substances are intended to act on the kidneys, they are recommended to be given in the form of solution, the density of which must be less than that of the serum of the blood; otherwise, instead of being absorbed, the solution will abstract liquid from the coats of the alimentary canal, and act as a hydragogue purgative. This application of the facts of endosmosis to the explanation of the diuretic and hydragogue action of saline substances is exceedingly ingenious and plausible; but must be received with considerable caution; as indeed should all physical and chemical explanations of the phenomena of living beings. It reduces the alimentary canal to the condition of a dead animal membrane; and supposes that the serum of the blood escapes through the parietes of the vessels; for it is certain that when two dissimilar fluids are separated by a dead membrane, *double* permeation is effected. Moreover, it overlooks one important fact, established by Dutrochet, namely, that in the case of certain liquids the stronger current is from the denser towards the lighter fluid.

Dr. Bird's third law is a proposition made by Dr. Barlow in the *Guy's Hospital Reports*, for October, 1844.

We shall conclude our observations on this chapter of Dr. Bird's work, by quoting his practical conclusions drawn from the laws above stated.

"1. Whenever it is desirable to impregnate the urine with a salt, or to excite diuresis by a saline combination, it must be exhibited in solution, so diluted as to contain less than five per cent. of the remedy, or not more than about twenty-five grains in an ordinary draught. The absorption of the drug into the capillaries will be ensured by a copious draught of water, or any diluent, immediately after each dose.

"2. When the urine contains purpurine, or other evidence of portal obstruction exist, the diuretics, or other remedies employed should be preceded or accompanied by the administration of mild mercurials—taraxacum, hydrochlorate of ammonia, or other cholitic remedies. By these means, or by local depletion, the portal vessels will be unloaded, and a free passage obtained to the general circulation.

"3. In cases of valvular or other obstructions existing in the heart and large vessels, it is next to useless to endeavour to excite diuretic action or appeal to the kidneys by remedies intended to be excreted by them. The best diuretics here will be found in whatever tends to diminish the congested state of the vascular system, and to moderate the action of the heart; as digitalis, colchicum, and other sedatives, with mild mercurials." 293.

In concluding our notice of Dr. Bird's book, our readers will expect from us a formal opinion of its merits and demerits. That we consider it an important work will be evident from the great space which we have devoted to its critical analysis. But it is disfigured by several blemishes. It appears to us to have been got up in a very hasty manner, and without time being allowed for the reading of the proof sheets. At least in no other way can we account for the numerous typographical and other errors which everywhere meet the eye. Our author is as unfortunate in spelling names and quoting books as the French writers proverbially are. With some words he seems to be undecided as to the proper etymology. Thus we have "octohedron" in one line, and "octahedron" in the next one. The French and German words are regularly murdered by him. He spells French words in German fashion, (ex. gr. "*chimie*" he writes "*chemie*,") while German words are spelled in French fashion, (ex. gr. "*de*" for "*der*." In the proper employment of capital and small letters gross errors are constantly committed. Thus in quoting the titles of German books, capital letters are frequently employed when they are inadmissible ; and in quoting botanical names, the same errors are committed, (ex. gr. ***Pisum Sativum*** is put for ***Pisum sativum*** ; ***Phaseolus Vulgaris*** for ***Phaseolus vulgaris.***) The latter error is constantly made by persons unacquainted with the rules followed by botanical writers; but Dr. Bird, as a lecturer on Materia Medica, deserves reproof for this fault. At p. 146 a very serious error occurs, "℥" being substituted for "ʒ." ***One ounce of strong nitric acid, and one ounce of strong muriatic acid*** being ordered instead, we presume, of ***one drachm*** of each of these acids. We trust that in another edition of the work, (which we doubt not will be called for,) these and numerous other errors will be rectified.

Notwithstanding the blemishes which we have considered it our duty to notice, we conscientiously believe it to be a very useful work. It contains an excellent summary of what is known on the subject of which it treats ; and we advise all our readers, who desire to be up to the present state of the chemical pathology of the kidney, and who wish to avail themselves of every practical novelty, to purchase it. It presents us with a clear, concise, and judicious exposition of the entire subject of urinary deposits, and should be in the library of every intelligent practitioner.

THE PHILOSOPHY OF THE MOVING POWERS OF THE BLOOD. By *G. Calvert Holland*, M.D., Physician Extraordinary to the Sheffield General Infirmary; formerly President of the Hunterian and Royal Physical Societies, Edinburgh, &c., &c. 8vo. pp. 308. London, Churchill, 1844.

THE title of this work is imposing, and it is probably owing to our expectations having been proportionally raised, that we have experienced some degree of disappointment in perusing it. Dr. Holland, in his preface, re-

marks, that "to enforce truths a-head of the seeming necessities of the age, is to receive either the contempt or the persecution of mankind."

That men should closely scrutinize the evidence and reasoning by the force of which it is wished they should abandon opinions founded not upon mere authority, but upon investigations marked by talent and conducted with care, is not only natural but desirable; but that there is in the times in which we live any other disinclination beyond that stated to the reception of novel opinions and doctrines, we must take leave to doubt. However this may be, we can answer for ourselves that we have no special reverence for things because they are old, nor for names because they are high; and, therefore, we were quite prepared to abandon Harvey, Haller, Magendie, Müller, M. Hall, and the many other men of mark, who are arrayed together in Dr. Holland's table of "Contents" as propagators of error and fallacy, but upon one condition, that the author should afford us better reasons for our new belief than for our former faith, and to this limited extent we trust we may be permitted to retain our orthodoxy.

In the work before us, most of the experiments that have been performed of late years, relating to the powers which accomplish the circulation of the blood, are criticised with much minuteness; and although we feel ourselves called upon to dissent from many of the author's conclusions, it is right to state that several of the objections urged evince much penetration, and are well worthy of consideration.

A leading object with Dr. Holland is to show the insufficiency of the celebrated experiments of Magendie, by which that eminent physiologist endeavoured to prove that the power of the left ventricle of the heart operated not only in the propulsion of the arterial, but likewise of the venous blood. The principle of these experiments, as most of our readers are aware, was as follows: a ligature was applied round the thigh of a dog, excluding only the femoral artery and vein; the vein was then separately tied near the groin, and a slight puncture was made into this vessel; a considerable jet of blood flowed out, but upon pressing the artery between the fingers, although the jet continued for some instants, it soon stopped, notwithstanding the whole length of the vein was full; upon removing the pressure the jet was re-established, as soon as the blood, injected by the heart, had arrived at the last divisions of the arteries. Upon this experiment the author observes:—

"The cessation of the jet is no evidence that it arises from interruption to the influence of the heart. The same result would occur were the capillaries the cause of venous circulation. The stream flows as long as the capillaries receive blood. If none exist between the roots of the vein and the compressed artery, whence is the power to be derived to act on the contents of the vein?

"In the attempt to prove that the venous current is propelled by the heart alone, in common justice to the capillaries they ought not to be deprived of blood. It is unphilosophical to withhold this, by which they are stimulated to contraction, and then to accuse them of the want of power. Were the physiologist to prevent the blood flowing into the left auricle, and observing the arteries full to distension, to call attention to the fact, as evidence that the contents of these vessels were not at all influenced by the heart, the inference would naturally be objected to. But the capillaries are placed precisely in this situation. There is no difference between them and the heart in the case supposed. The artery, from which they receive their stimulus and source of contraction, is

empty, and, consequently, the supply is cut off. There is a column of blood in advance of them, but there is none, *à-tergo*, by which to act upon it." P. 171.

These objections to us are not satisfactory, for it cannot fairly be inferred from the account of the experiment that, although the main artery was seen to contract and thus to become empty, the vast plexus of small arteries and capillaries of the limb was also in a state of vacuity, and consequently that the latter vessels wanted the necessary condition of their assumed action, namely, the presence of blood. On the contrary, this and other similar experiments are more reasonably explained upon the assumption, that the vis-à-tergo afforded by the left ventricle is necessary to the venous circulation. The well-known fact, that if, in venæsection, the arm is bound up so tightly as to compress the brachial artery, after the first jet no blood will flow, although it is certain the limb is full of blood, is a strong corroboration of the truth of M. Magendie's deduction.

But there are others, and more decided proofs, that the heart's propulsive force can influence the veins. One of the most satisfactory of these is the occasional occurrence of a venous pulse, caused, not like the more ordinary one by a reflux of blood from the right auricle, but by a *vis-à-tergo*. M. Martin Solon has recently communicated some very instructive cases, (Bulletin de l'Acad. Roy. de Med. 1844, p. 102,) from which we extract the following particulars. One of these cases occurred in a young man, aged 23, the subject of pleuro-pneumonia on both sides: the pulse of the radial artery 110, full and strong; the impulse of the heart strong and energetic; the dorsal veins of the hands, which were prominent, rounded, and of a slightly blueish and rose colour, presented a movement of diastole and systole sensible to the sight and appreciable by the touch: these pulsatile motions were isochronous with the radial pulse; they ceased, and the veins diminished in volume, when pressure was made upon these vessels towards the fingers, whilst, on the contrary, the motions persisted when pressure was applied to the wrist; compression of the brachial artery also caused the pulsations to cease. Other and similar cases are related, and those of Dr. Ward (Medical Gazette, 1832, p. 376) and of Dr. Graves are quoted.

Dr. Ward, in the paper referred to, attributed this interesting phenomenon "to the excessive action of the heart, pushing the thin and impoverished blood through the capillaries straight on into the veins;" a view which is adopted by M. Solon, though we are sorry to say, without any reference to the earlier English observer. There can be no doubt that the causes assigned by Dr. Ward must be operative; but the obstruction à fronte to the free return of the venous blood, dependent upon the embarrassment of the pulmonary circulation, which we believe always exists in these cases, doubtless is an additional and a necessary condition.

But whatever may be the cause of this form of venous pulse, the latter is an unquestionable proof that the power of the heart can, under certain circumstances, influence the circulation in the veins.

Dr. Holland also calls in question the opinion of physiologists, resting upon the experiments of Poiseuille and other evidence, that the elasticity of the arteries is the main cause by which the periodic impulse of the heart is converted into a permanent force, and by which the current of the blood acquires the uniformity observed in the capillary vessels. The au-

ther remarks, "this experiment (Poiseuille's) proves that an artery, when greatly distended, as in this instance, is capable of re-acting on its contents; but no conclusion can be drawn from the fact in reference to the agency of elasticity in the circulation of the blood." In this, as on most other points, we do not agree with the writer, and for this, among other reasons because we do not think it probable that such a high degree of elasticity would have been conferred upon the arterial tunics, so great indeed as to have become proverbial, if it were not designed to perform some important office in the mechanism of the circulation.

Dr. Holland, in criticising the researches of Dr. M. Hall and others, objects with justice to conclusions being drawn concerning the nature of the capillary circulation, after great disturbance has been induced by the experiments themselves. If, for instance, a ligature be applied around the leg of a frog, what satisfactory results can be obtained when, on the one hand, the supply of blood through the arteries is cut off, and, on the other, the exit through the veins is totally obstructed? Herein, in fact, is comprised the essence of the author's charges against experimentalists: "the analysis has constantly presented to the mind two objections—an obstacle in advance of the capillaries, and an interruption to the supply from behind." P. 203.

As the following experiment is conceived by the writer to be free from all such difficulties, we give it in his own words:—

"It is not my intention to examine the phenomena of fœtal circulation, but to allude only to one striking peculiarity, viz., the circulation of the blood in the umbilical vein. This fluid is transmitted from the placenta to the fœtus without the aid of any propulsive organ. The capillaries are, indeed, the only source of motive power shown to exist, and hence, the placenta separated from the uterus, appeared capable of determining the influence of capillaries, in urging the blood through the long capacious vein. To test the fact, a placenta was procured, twenty minutes after separation from the uterus, and placed with the exception of the cord, in a bladder, which was immersed in water, at the temperature of 100° Fahrenheit. The free extremity of the cord, at the same moment, was elevated to an angle of 38°, resting on the edge of a glass, and at the distance of a foot from the placenta. At the commencement no blood escaped from the vein, but in two minutes from the immersion, it began to flow, and continued for about twenty minutes, and at this time, the glass had received above an ounce.

"Here, then, is an experiment unexceptionable in its character, demonstrating the power of the capillaries to carry on the circulation, not only in their complicated net-work of vessels, but in larger vessels, ultimately terminating in a capacious vein." P. 205.

In the correctness of the assertion that the experiment is "unexceptionable" we cannot concur; indeed, the author himself observes of it that "the disengagement of it (the placenta) from the uterus disturbs the normal relations of these vessels," that is the placental arteries, veins, and capillaries. It is rather surprising that Dr. Holland, who urges his "objections" somewhat unsparingly, should not have been more judicious in the selection of his own experiment, and particularly that he should not have guarded against "an interruption to the supply from behind." The oozing from the umbilical vein, for, as only an ounce was collected in twenty minutes, the escape of blood could have amounted to

nothing more, it may reasonably be inferred depended upon that gradual contraction of the arteries, which it has been distinctly shown by Hunter and many subsequent observers, those vessels possess, by which they are enabled to adapt themselves to the varying bulk of their contents. The great point which the author wishes to establish by the experiment we have detailed, and by his elaborate critiques, is that the capillary vessels, which he states, but erroneously, to be the seat of all the vital actions, assist by their contractility in the circulation.

Without dwelling longer upon this questio vexata, we will only state it is our conviction, that although the capillaries have distinct walls (we have seen them plainly with the microscope, as Schwann and Henle had before, in vessels taken from the pia mater and elsewhere), and although they possess a power of contraction, and especially a capability of becoming preternaturally dilated, yet that they do not aid in the normal circulation of the blood by any propulsive action.

Our limits will not allow us to follow the author in his criticisms relating to the circulation of the acardiac fœtus, which in themselves offer little that is novel. But we must remark in conclusion that, the ingenious experiment of Dr. M. Hall, in which, by placing a heavy probe upon the dorsal fin of the eel, he rendered the circulation in the capillaries *pulsatile*, and thus demonstrated that the single ventricle of the fish does operate through *two sets of capillary vessels*, the branchial and systemic, is an all-important element in this and similar inquiries, and is not liable to be set aside, notwithstanding Dr. Holland's "Objections."

A THERMOMETRICAL TABLE ON THE SCALES OF FAHRENHEIT, CENTIGRADE, AND REAUMUR, &c. By *Alfred S. Taylor*, Lecturer on Chemistry, &c. London, 1845. T. and R. Willats.

WE have received this exceedingly instructive "Thermometric Table," by Mr. Alfred Taylor, of Guy's Hospital. It contains a vast deal of information in little space. By its aid, not only can we read off at a glance the corresponding degrees of the three thermometers at present in use—Fahrenheit's, Reaumur's, and the Centigrade—but we also find out a host of interesting particulars connected with Climatology, Physical Geography, Chemistry, and Physiology. By having it at his side, the student will save himself no little time and trouble in the way of reference to different books.

Would that Mr. Taylor would give us, at his leisure, a similar table of weights and measures, British and Foreign ; so that the reader of French and German works could at once reduce the one into the other.

MEDICAL REFORM.

Remarks on the Tripartite Division of Medicine. By *Michael Keating O'Shea.* Gilbert, 1845.

A Bill for Regulating the Profession of Physic and Surgery. (Ordered to be Printed, Feb. 1845.)

The Apothecaries' Society's (2nd) Address to the General Practitioners on the New Medical Bill, as contrasted with the Bill of last Session. Highley, 1845.

Being among those who refused to join in an indiscriminate opposition to the former measure proposed by Sir James Graham, in the hope and belief that, when informed of the wishes and just expectations of the Profession, (whose opinion he stated himself so anxious to be placed in possession of,) that Minister would consent to such alterations and amendments as would render it a useful and satisfactory enactment, we deeply regret having to record the disappointment the perusal of the provisions of the new Bill has occasioned us. The General Practitioners neither can nor ought to feel contented with this reply to their just and reasonable demands. It is true the new measure was ushered in with a conciliatory speech on the part of its proposer, and a distinct recognition of the usefulness, importance, honourable conduct, and humane dispositions of this large class of society. But as we never believed that the former measure was introduced, as roundly stated by so many of its opponents, with the express intention of degrading the great mass of the Profession, so we are quite at a loss to perceive how the value of the present one is enhanced by an admission which we suppose any other member of the House of Commons would have made just as cheerfully. On the contrary, we see cause for discouragement in this. If Sir James Graham, while acknowledging the excellent qualities and vast usefulness of the General Practitioner, still withholds from him his most elementary rights, we can only come to the conclusion that he remains, after all the pains which have been taken to instruct him, hopelessly ignorant of what these are, or is prevented by some influence adverse to their recognition from doing justice to them. That the former element is not an inconsiderable one in determining his proceedings, we may judge from his astounding reply to a question asked him recently in the House, as to his intentions in regard to amending the Charter granted to the College of Surgeons. He stated, he was "at a loss to understand what were the grievances or exclusions his hon. friend's question referred to!" This, joined with the belief expressed in his speech that the good understanding between the governing powers and members of the College would shortly become augmented by the operation of this very charter, shows such a state of utter ignorance upon the very matter which has most excited the attention and dissatisfaction of the whole profession, that the expectation of its removal must be entertained by those only who are in possession of more sanguine temperaments than ourselves.

It is true the Minister stated he thought the General Practitioners ought

to have a voice in the deliberations of the Council of Health; and that one or two of his nominees would be taken from their body. But this is not sufficient. A much larger proportion should be admitted, and such admission should not depend on the caprice of the Home Secretary of the day, but be as definitely provided for as is that of the representatives of the other branches of the Profession. Then, again, neither the Act itself nor the Statement contain any provision for, or allusion to what is, after all, the great object for which all medical reformers have been struggling, viz., *the complete representative system.* So far as the Charters hitherto, or about to be granted, are concerned, we find this, the main-spring of all future improvements in the governance of our various medical institutions, completely trodden under foot; and the surgeon, physician, and general practitioner, deliberately informed they are unable to perform elective functions entrusted to the pharmaceutist, the veterinarian, and the meanest burgess. It remains to be seen whether the Crown will consent to the more liberal construction of the new inevitable Charter of Incorporation of General Practitioners.

It is also true that Sir James Graham has given in to what he considers the prejudices of the profession as respects the punishment of unlicensed practitioners. But if ever a benefit was marred by the mode of its bestowal and the contingencies of its enjoyment, it is the case here. In the place of a simple penal clause directed against all unregistered persons, who engaged in the practice of physic, whether under the ordinary professional titles or no titles at all, we are to have the Apothecaries' Act continued in existence for the performance of that of its functions which of all it had been found least able to compass; and that too when the funds of the Society will have become much diminished by the loss of examination fees. It is true fines will be inflicted upon those who assume *one of* the recognized professional appellations; but how easily such a provision as this will be evaded need not be told.

It is but due to the Apothecaries' Society to admit they have seen as early as others the defects of the Act which regulated their proceedings, and have done what lay in their power to remedy these; and the preference they have shown of merging themselves into an improved organization of General Practitioners, to constitute a mere subordinate fragment of the new Examining Board is a very proper and honourable one. No valid reason exists why their Act should not be forthwith abolished as originally contemplated. Its retention will only give rise to confusion, and prove an impediment to future progress.

If we understand the new Bill aright, the title of "Surgeon" is intended to be confined to those who have undergone a second special examination before the College of Surgeons, and will, in that case, we suppose, be equivalent to "Fellow." If so, the provision is a most unjust one, and can only have a tendency to lower the great body of general practitioners in the eyes of the public. Always having hitherto borne this title, the forcing them to assume the name of mere Licentiate is neither more nor less than a degradation. Another injustice contemplated in this Bill is the obliging a licentiate or fellow who has obtained his diploma in one part of the so-called United Kingdom, to pay additional fees for liberty to practise in another portion, which is under the jurisdiction of another College. He is

allowed to practise without additional examination, but not without additional fees. A man found competent to practise in one part of the kingdom, and having paid for his diploma, should certainly not be taxed afresh in this way.

In the interval which has elapsed between the introduction of the two Bills, the Association of General Practitioners has made a most rapid advance—numbering now, we believe, very near four thousand members. The deplorable and suicidal policy followed by the Council of the College of Surgeons, which conceived in utter ignorance of the high spirit of the great body of its members, is adhered to with a foolish obstinacy; and the unsatisfactory extent of the changes proposed by Sir James Graham, holding out now so little probability that he will consent to such as will prove acceptable, have rendered this great organization absolutely essential, and so imposing. We perceive with pleasure that one great defect in the constitution of the Examining Board of the Apothecaries' Society is not intended to be persevered in, viz., the confining the Examiners to one grade of the profession. Conjoined with general practitioners, there are to be men eminent in various branches of medical science, and experienced in teaching. This is as it should be, if the General Practitioner wishes to advance his position; and with a body so constituted we confidently anticipate finding the examinations become more practical in their character and more honourable to the successful candidates. We are not among those who anticipate any deterioration of their rank in public estimation, or any loss of caste, will be sustained by the Incorporation of the General Practitioners into a separate body. On the contrary, we believe a separation from the drug-selling concerns of the Apothecaries' Society, and an improvement in the mode of examination, will be attended with a proportionate elevation of character and consideration. To submit to the existing and contemplated state of things would, on the other hand, insure and merit degradation.

Mr. O'Shea's "Remarks" contain nothing new upon the subject of Medical Reform, and are drawn up in a very rambling manner. The "Address" of the Society is a temperate examination of the provisions of the New Bill, which is rather more leniently dealt with than we should have expected from the tenor of the former publications of the Society. With the following extract we shall conclude this notice:—

"A new clause has been introduced into the present Bill, empowering the Council of Health to erase from the register the name of any person who shall be convicted of felony, or who shall be found to have procured his registry by fraud, or to have wilfully given a false certificate in any case in which the certificate of a Physician or Surgeon is required by law; and this punishment is to be followed by the total loss of all the privileges of a Medical Practitioner. The Society would suggest, that this clause would be more likely to effect its own object if a power were given to the Council of Health, to restore a person to the Register whose name had been erased, if a fitting case for the exercise of such a power should present itself. The inability of the Council, *under any circumstances*, to restore a name which has once been erased from the Register, would probably be found to render the Council unwilling to exercise its power in cases, which, under other circumstances, would justly merit such a punishment."

Periscope;

OR,

CIRCUMSPECTIVE REVIEW.

"Ore trahit quodcunque potest, atque addit acervo."

Spirit of the Foreign Periodicals.

Disease regarded as a False or Spurious Organization. By Dr. Jahn.

There is a good deal of German mysticism in the following remarks, which are thereby rendered rather hard to be understood in certain passages. Our readers will however find no difficulty in tracing out the leading features of the doctrine which the learned writer seeks to establish.—(*Rev.*)

Since the experiments of Langenbeck have become generally known, the most incredulous must surely have ceased to doubt that the propagation of (many) diseases takes place in the same manner as that of the simplest forms of animal life. The opinion of Stark, that the production,—apart from the contagion—of diseases must be regarded as an original generation (*generatio æquivoca,*) has been much objected to; but it seems to have been forgotten that the formation of the Infusoria, Vorticellæ, Fungi, &c., as morbid productions, occurs without contagion, and that these formations may, in the strictest sense be regarded as instances of a veritable spontaneous generation.

A disease may justly be regarded as a *false* or *spurious* organization; inasmuch as, besides the normal and primitive vital type, there is then present in the system a new and foreign type, which arises either from a transformation of the organic substance, or from a production of a new and extrinsic formation. This morbid type is developed and maintained at the expense of the normal life. A vast number of arguments and illustrations might be adduced to show that the *prima causa mali* in (many) diseases is really and truly of an organic or animalcular nature: let us briefly consider a few of them.

There are certain morbid productions which almost every one must regard as genuine false organizations. Of this nature are—

1. The veritable morbid formations of animal life: for example, Entozoary *anthelminths;* various *mites*, the products of disease; various *infusoria*, whether the product of disease, or of spontaneous development.

2. Different vegetable productions; such as the *muscardine* of the silk-worm; the contagious *confervæ*, discovered by Hannover in and upon the aquatic salamander; the *fungi*, found by Schoenlein existing in the patches of *porrigo lupinosa*, and which Remack has shown may be propagated by inoculation; the various capillary *fungiform* productions observed by Fuchs and others in several exanthematous eruptions, &c. It would be difficult to admit that either these vegetable productions or their granules had entered the animal economy from without, and were not generated within. In the case of plants themselves, we have numerous instances, of morbid vegetable formations, belonging to various groups of the Cryptogamic family, namely, to the *dartres*. We may mention, as belonging to this class, the *uredo*, *urbmices*, *pharmegdium*, *puccinia*, *accidium*, *chrysomixa*, &c., &c.

Among the diseases of Plants, we cannot fail to recognise some under the form of *fungi*, which are generally considered as such, and are admitted into all

systems of botanical arrangement: in this respect they are of the highest importance, as bearing upon the doctrine of the organic nature of diseases. The opponents of the doctrine of Spontaneous Generation will probably start the objection that the *fungi*, mentioned above as the products of disease, are never developed spontaneously in the bodies of plants themselves; but on the contrary, that they attach themselves and become developed in the same manner as the genuine parasitic plants that come from without. The observations however of *Meyer* and *Unger* on the production of the Cryptoganic formations, and of the mites of the cereal grains are, we think, unrefutable, and wholly at variance with this idea.

3. Among the spontaneous animal and vegetable morbid productions, we must enumerate the *Psorosperms* described by Müller, and the corpuscles (discovered by the same naturalist) which constitute a peculiar disease of the swimming bladder of the *Gadus Callurias*. Both of these formations well deserve notice; on the one hand as affording a strong argument in favour of Equivocal Generation, and on the other, as having evidently a peculiar organization, and being organized existences endowed with an individual life, and yet of such a nature as to forbid our classifying them among either plants or animals.

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4. In the false or spurious organized products, we meet with formations which, on the one hand, are developed in the affected organism after the manner of its normal organs, and are associated with it; and, on the other hand, do not belong, and are foreign or even hostile to it, seeing that they destroy its organic matter like parasitic growths.

They are organized, and exhibit a structure like that of normal organisms; they possess a determinate organic configuration, which often very closely resembles the form of regular or normal agents; like the ultimate organic elements, they consist of masses which are generally of a rounded shape, and are surrounded with a proper envelope. * * * * * These points have a proper vital course, proper periods, and peculiar processes of nutrition and secretion. Like many beings low in the scale of organic life, they finish by a softening and a dissolution of the mass. Moreover, they almost all possess the faculty of self-reproduction; for, alike in the diseased and healthy organism, they can propagate (by contagion) by means of molecules, which detach themselves from the general mass, and which, being then deposited upon another point, become developed and give rise to an affection altogether similar to that from which they were derived. These molecules possess so independent a vitality that they are capable of resisting the assimilative power of the organism. It is for this reason that it is generally so difficult, and often quite impossible, to cure them; for they possess a force of reproduction much greater than that of the organism and its different parts, being not unfrequently capable of reproducing themselves, even after they have been separated into invisible rudiments. They become fixed in the system, so that it is utterly impossible to trace any line of separation. This is clearly proved both by the morbid formations (*psorosperms* and others) discovered by Müller, by the uncertainty that still prevails as to the nature of Acephalocysts, and by the circumstance that certain naturalists have declared that several false organizations were entozoary productions.

5. The Exanthemata are closely allied to the spurious organic productions to which we have been alluding. Contagious diseases are, like false organizations, distinguished by their generative activity and their power of self-reproduction, by their fixed periods and terms of duration, and by the co-existence of other material productions that usually accompany them.

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As the entire organism is composed of primitive molecules (cellules,) and as it is a universal physiological law that certain material or organic changes attend every dynamic arrangement, we must attribute all morbid alterations in the body

ther remarks, "this experiment (Poiseuille's) proves that an artery, when greatly distended, as in this instance, is capable of re-acting on its contents; but no conclusion can be drawn from the fact in reference to the agency of elasticity in the circulation of the blood." In this, as on most other points, we do not agree with the writer, and for this, among other reasons because we do not think it probable that such a high degree of elasticity would have been conferred upon the arterial tunics, so great indeed as to have become proverbial, if it were not designed to perform some important office in the mechanism of the circulation.

Dr. Holland, in criticising the researches of Dr. M. Hall and others, objects with justice to conclusions being drawn concerning the nature of the capillary circulation, after great disturbance has been induced by the experiments themselves. If, for instance, a ligature be applied around the leg of a frog, what satisfactory results can be obtained when, on the one hand, the supply of blood through the arteries is cut off, and, on the other, the exit through the veins is totally obstructed? Herein, in fact, is comprised the essence of the author's charges against experimentalists: "the analysis has constantly presented to the mind two objections—an obstacle in advance of the capillaries, and an interruption to the supply from behind." P. 203.

As the following experiment is conceived by the writer to be free from all such difficulties, we give it in his own words:—

"It is not my intention to examine the phenomena of fœtal circulation, but to allude only to one striking peculiarity, viz., the circulation of the blood in the umbilical vein. This fluid is transmitted from the placenta to the fœtus without the aid of any propulsive organ. The capillaries are, indeed, the only source of motive power shown to exist, and hence, the placenta separated from the uterus, appeared capable of determining the influence of capillaries, in urging the blood through the long capacious vein. To test the fact, a placenta was procured, twenty minutes after separation from the uterus, and placed with the exception of the cord, in a bladder, which was immersed in water, at the temperature of 100° Fahrenheit. The free extremity of the cord, at the same moment, was elevated to an angle of 38°, resting on the edge of a glass, and at the distance of a foot from the placenta. At the commencement no blood escaped from the vein, but in two minutes from the immersion, it began to flow, and continued for about twenty minutes, and at this time, the glass had received above an ounce.

"Here, then, is an experiment unexceptionable in its character, demonstrating the power of the capillaries to carry on the circulation, not only in their complicated net-work of vessels, but in larger vessels, ultimately terminating in a capacious vein." P. 205.

In the correctness of the assertion that the experiment is "unexceptionable" we cannot concur; indeed, the author himself observes of it that "the disengagement of it (the placenta) from the uterus disturbs the normal relations of these vessels," that is the placental arteries, veins, and capillaries. It is rather surprising that Dr. Holland, who urges his "objections" somewhat unsparingly, should not have been more judicious in the selection of his own experiment, and particularly that he should not have guarded against "an interruption to the supply from behind." The oozing from the umbilical vein, for, as only an ounce was collected in twenty minutes, the escape of blood could have amounted to

nothing more, it may reasonably be inferred depended upon that gradual contraction of the arteries, which it has been distinctly shown by Hunter and many subsequent observers, those vessels possess, by which they are enabled to adapt themselves to the varying bulk of their contents. The great point which the author wishes to establish by the experiment we have detailed, and by his elaborate critiques, is that the capillary vessels, which he states, but erroneously, to be the seat of all the vital actions, assist by their contractility in the circulation.

Without dwelling longer upon this questio vexata, we will only state it is our conviction, that although the capillaries have distinct walls (we have seen them plainly with the microscope, as Schwann and Henle had before, in vessels taken from the pia mater and elsewhere), and although they possess a power of contraction, and especially a capability of becoming preternaturally dilated, yet that they do not aid in the normal circulation of the blood by any propulsive action.

Our limits will not allow us to follow the author in his criticisms relating to the circulation of the acardiac fœtus, which in themselves offer little that is novel. But we must remark in conclusion that, the ingenious experiment of Dr. M. Hall, in which, by placing a heavy probe upon the dorsal fin of the eel, he rendered the circulation in the capillaries *pulsatile*, and thus demonstrated that the single ventricle of the fish does operate through *two sets of capillary vessels*, the branchial and systemic, is an all-important element in this and similar inquiries, and is not liable to be set aside, notwithstanding Dr. Holland's "Objections."

A THERMOMETRICAL TABLE ON THE SCALES OF FAHRENHEIT, CENTIGRADE, AND REAUMUR, &c. By *Alfred S. Taylor*, Lecturer on Chemistry, &c. London, 1845. T. and R. Willats.

WE have received this exceedingly instructive "Thermometric Table," by Mr. Alfred Taylor, of Guy's Hospital. It contains a vast deal of information in little space. By its aid, not only can we read off at a glance the corresponding degrees of the three thermometers at present in use—Fahrenheit's, Reaumur's, and the Centigrade—but we also find out a host of interesting particulars connected with Climatology, Physical Geography, Chemistry, and Physiology. By having it at his side, the student will save himself no little time and trouble in the way of reference to different books.

Would that Mr. Taylor would give us, at his leisure, a similar table of weights and measures, British and Foreign ; so that the reader of French and German works could at once reduce the one into the other.

MODERN COOKERY IN ALL ITS BRANCHES REDUCED TO A SYSTEM OF EASY PRACTICE, &c. By *Eliza Acton*. Longman and Co. 1845.

AMONG the revolutions and improvements that have taken place in medicine during the present century, the increased attention to DIETETICS is one of the most important and conspicuous. We seldom take physic except when we are ill; but we are always taking food, and many of our maladies are induced by improper diet. We strongly suspect that our augmented longevity is as much owing to food as to physic. Cookery, is therefore, not beneath the notice of the physician. A late celebrated—at least *fashionable*—physician owed much of his popularity to his readiness in prescribing a dish as well as a draught for his patient;—and a living physician, of high literary and scientific attainments, is not less indebted to his chemistry of the kitchen, than to his pharmaceutical knowledge, for the high station he now holds. A knowledge of the cuisine is more necessary to the medical man than to any other professional man. His constant intercourse with dyspeptics—hypochondriacs—invalids and convalescents, calls upon him daily and hourly for advice as to diet; and he finds no small difficulty in adapting the dish to the nature of the complaint and the habit of the individual. Many a convalescent would fall back and perish were not food furnished of a kind that will suit the languid appetite and the morbidly fastidious palate.

Although England has long taken the lead in arts, commerce, and manufactures, she has made slow advance in the noble science of *gastronomy*, and has generally called in the assistance of France and Italy in the mysterious chemical processes going on in the lower regions of *John Bull's* castle. There JOHNNY CRAPEAUD rules the roast, sending up, daily, to the master of the mansion a farrago of "dishes tortured from their native taste," sufficient to feed the whole brood of Proteian devils that prey upon the vitals of the family, and give unfailing occupation to the doctor, the apothecary, and the undertaker! Everybody knows that God sends food to mankind, but that the cooks come from a very different quarter. The young doctor, therefore, who has often a young wife, and still younger children, should know whether he has "death in the pot," as well as dumplings. Economy in cooking is equally important to the rising generation of our brethren, as economy in dress, house-rent, and equipage—perhaps more so. We cannot, therefore, too warmly commend to the notice of our junior brethren this compilation of Eliza Acton, which will prove as useful to young Mrs. and her cook in the kitchen, as Thomson's Dispensatory or Conspectus to the young doctor in the library.

MEDICAL REFORM.

REMARKS ON THE TRIPARTITE DIVISION OF MEDICINE. By *Michael Keating O'Shea.* Gilbert, 1845.

A BILL FOR REGULATING THE PROFESSION OF PHYSIC AND SURGERY. (Ordered to be Printed, Feb. 1845.)

THE APOTHECARIES' SOCIETY'S (2nd) ADDRESS TO THE GENERAL PRACTITIONERS ON THE NEW MEDICAL BILL, AS CONTRASTED WITH THE BILL OF LAST SESSION. Highley, 1845.

BEING among those who refused to join in an indiscriminate opposition to the former measure proposed by Sir James Graham, in the hope and belief that, when informed of the wishes and just expectations of the Profession, (whose opinion he stated himself so anxious to be placed in possession of,) that Minister would consent to such alterations and amendments as would render it a useful and satisfactory enactment, we deeply regret having to record the disappointment the perusal of the provisions of the new Bill has occasioned us. The General Practitioners neither can nor ought to feel contented with this reply to their just and reasonable demands. It is true the new measure was ushered in with a conciliatory speech on the part of its proposer, and a distinct recognition of the usefulness, importance, honourable conduct, and humane dispositions of this large class of society. But as we never believed that the former measure was introduced, as roundly stated by so many of its opponents, with the express intention of degrading the great mass of the Profession, so we are quite at a loss to perceive how the value of the present one is enhanced by an admission which we suppose any other member of the House of Commons would have made just as cheerfully. On the contrary, we see cause for discouragement in this. If Sir James Graham, while acknowledging the excellent qualities and vast usefulness of the General Practitioner, still withholds from him his most elementary rights, we can only come to the conclusion that he remains, after all the pains which have been taken to instruct him, hopelessly ignorant of what these are, or is prevented by some influence adverse to their recognition from doing justice to them. That the former element is not an inconsiderable one in determining his proceedings, we may judge from his astounding reply to a question asked him recently in the House, as to his intentions in regard to amending the Charter granted to the College of Surgeons. He stated, he was "at a loss to understand what were the grievances or exclusions his hon. friend's question referred to!" This, joined with the belief expressed in his speech that the good understanding between the governing powers and members of the College would shortly become augmented by the operation of this very charter, shows such a state of utter ignorance upon the very matter which has most excited the attention and dissatisfaction of the whole profession, that the expectation of its removal must be entertained by those only who are in possession of more sanguine temperaments than ourselves.

It is true the Minister stated he thought the General Practitioners ought

to have a voice in the deliberations of the Council of Health; and that one or two of his nominees would be taken from their body. But this is not sufficient. A much larger proportion should be admitted, and such admission should not depend on the caprice of the Home Secretary of the day, but be as definitely provided for as is that of the representatives of the other branches of the Profession. Then, again, neither the Act itself nor the Statement contain any provision for, or allusion to what is, after all, the great object for which all medical reformers have been struggling, viz., *the complete representative system.* So far as the Charters hitherto, or about to be granted, are concerned, we find this, the main-spring of all future improvements in the governance of our various medical institutions, completely trodden under foot; and the surgeon, physician, and general practitioner, deliberately informed they are unable to perform elective functions entrusted to the pharmaceutist, the veterinarian, and the meanest burgess. It remains to be seen whether the Crown will consent to the more liberal construction of the new inevitable Charter of Incorporation of General Practitioners.

It is also true that Sir James Graham has given in to what he considers the prejudices of the profession as respects the punishment of unlicensed practitioners. But if ever a benefit was marred by the mode of its bestowal and the contingencies of its enjoyment, it is the case here. In the place of a simple penal clause directed against all unregistered persons, who engaged in the practice of physic, whether under the ordinary professional titles or no titles at all, we are to have the Apothecaries' Act continued in existence for the performance of that of its functions which of all it had been found least able to compass; and that too when the funds of the Society will have become much diminished by the loss of examination fees. It is true fines will be inflicted upon those who assume one of the recognized professional appellations; but how easily such a provision as this will be evaded need not be told.

It is but due to the Apothecaries' Society to admit they have seen as early as others the defects of the Act which regulated their proceedings, and have done what lay in their power to remedy these; and the preference they have shown of merging themselves into an improved organization of General Practitioners, to constitute a mere subordinate fragment of the new Examining Board is a very proper and honourable one. No valid reason exists why their Act should not be forthwith abolished as originally contemplated. Its retention will only give rise to confusion, and prove an impediment to future progress.

If we understand the new Bill aright, the title of "Surgeon" is intended to be confined to those who have undergone a second special examination before the College of Surgeons, and will, in that case, we suppose, be equivalent to "Fellow." If so, the provision is a most unjust one, and can only have a tendency to lower the great body of general practitioners in the eyes of the public. Always having hitherto borne this title, the forcing them to assume the name of mere Licentiate is neither more nor less than a degradation. Another injustice contemplated in this Bill is the obliging a licentiate or fellow who has obtained his diploma in one part of the so-called United Kingdom, to pay additional fees for liberty to practise in another portion, which is under the jurisdiction of another College. He is

allowed to practise without additional examination, but not without additional fees. A man found competent to practise in one part of the kingdom, and having paid for his diploma, should certainly not be taxed afresh in this way.

In the interval which has elapsed between the introduction of the two Bills, the Association of General Practitioners has made a most rapid advance—numbering now, we believe, very near four thousand members. The deplorable and suicidal policy followed by the Council of the College of Surgeons, which conceived in utter ignorance of the high spirit of the great body of its members, is adhered to with a foolish obstinacy; and the unsatisfactory extent of the changes proposed by Sir James Graham, holding out now so little probability that he will consent to such as will prove acceptable, have rendered this great organization absolutely essential, and so imposing. We perceive with pleasure that one great defect in the constitution of the Examining Board of the Apothecaries' Society is not intended to be persevered in, viz., the confining the Examiners to one grade of the profession. Conjoined with general practitioners, there are to be men eminent in various branches of medical science, and experienced in teaching. This is as it should be, if the General Practitioner wishes to advance his position; and with a body so constituted we confidently anticipate finding the examinations become more practical in their character and more honourable to the successful candidates. We are not among those who anticipate any deterioration of their rank in public estimation, or any loss of caste, will be sustained by the Incorporation of the General Practitioners into a separate body. On the contrary, we believe a separation from the drug-selling concerns of the Apothecaries' Society, and an improvement in the mode of examination, will be attended with a proportionate elevation of character and consideration. To submit to the existing and contemplated state of things would, on the other hand, insure and merit degradation.

Mr. O'Shea's "Remarks" contain nothing new upon the subject of Medical Reform, and are drawn up in a very rambling manner. The "Address" of the Society is a temperate examination of the provisions of the New Bill, which is rather more leniently dealt with than we should have expected from the tenor of the former publications of the Society. With the following extract we shall conclude this notice :—

"A new clause has been introduced into the present Bill, empowering the Council of Health to erase from the register the name of any person who shall be convicted of felony, or who shall be found to have procured his registry by fraud, or to have wilfully given a false certificate in any case in which the certificate of a Physician or Surgeon is required by law; and this punishment is to be followed by the total loss of all the privileges of a Medical Practitioner. The Society would suggest, that this clause would be more likely to effect its own object if a power were given to the Council of Health, to restore a person to the Register whose name had been erased, if a fitting case for the exercise of such a power should present itself. The inability of the Council, *under any circumstances*, to restore a name which has once been erased from the Register, would probably be found to render the Council unwilling to exercise its power in cases, which, under other circumstances, would justly merit such a punishment."

Periscope;

OR,

CIRCUMSPECTIVE REVIEW.

"Ore trahit quodcunque potest, atque addit acervo."

Spirit of the Foreign Periodicals.

Disease regarded as a False or Spurious Organization. By Dr. Jahn.

There is a good deal of German mysticism in the following remarks, which are thereby rendered rather hard to be understood in certain passages. Our readers will however find no difficulty in tracing out the leading features of the doctrine which the learned writer seeks to establish.—(*Rev.*)

Since the experiments of Langenbeck have become generally known, the most incredulous must surely have ceased to doubt that the propagation of (many) diseases takes place in the same manner as that of the simplest forms of animal life. The opinion of Stark, that the production,—apart from the contagion—of diseases must be regarded as an original generation (*generatio æquivoca*,) has been much objected to; but it seems to have been forgotten that the formation of the Infusoria, Vorticellæ, Fungi, &c., as morbid productions, occurs without contagion, and that these formations may, in the strictest sense be regarded as instances of a veritable spontaneous generation.

A disease may justly be regarded as a *false* or *spurious* organization; inasmuch as, besides the normal and primitive vital type, there is then present in the system a new and foreign type, which arises either from a transformation of the organic substance, or from a production of a new and extrinsic formation. This morbid type is developed and maintained at the expense of the normal life. A vast number of arguments and illustrations might be adduced to show that the *prima causa mali* in (many) diseases is really and truly of an organic or animalcular nature: let us briefly consider a few of them.

There are certain morbid productions which almost every one must regard as genuine false organizations. Of this nature are—

1. The veritable morbid formations of animal life: for example, Entozoary *anthelminths*; various *mites*, the products of disease; various *infusoria*, whether the product of disease, or of spontaneous development.

2. Different vegetable productions; such as the *muscardine* of the silk-worm; the contagious *confervæ*, discovered by Hannover in and upon the aquatic salamander; the *fungi*, found by Schoenlein existing in the patches of *porrigo lupinosa*, and which Remack has shown may be propagated by inoculation; the various capillary *fungiform* productions observed by Fuchs and others in several exanthematous eruptions, &c. It would be difficult to admit that either these vegetable productions or their granules had entered the animal economy from without, and were not generated within. In the case of plants themselves, we have numerous instances, of morbid vegetable formations, belonging to various groups of the Cryptogamic family, namely, to the *dartres*. We may mention, as belonging to this class, the *uredo*, *urbmices*, *pharmegdium*, *puccinia*, *accidium*, *chrysomixa*, &c., &c.

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systems of botanical arrangement: in this respect they are of the highest importance, as bearing upon the doctrine of the organic nature of diseases. The opponents of the doctrine of Spontaneous Generation will probably start the objection that the *fungi*, mentioned above as the products of disease, are never developed spontaneously in the bodies of plants themselves; but on the contrary, that they attach themselves and become developed in the same manner as the genuine parasitic plants that come from without. The observations however of *Meyer* and *Unger* on the production of the Cryptoganic formations, and of the mites of the cereal grains are, we think, unrefutable, and wholly at variance with this idea.

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4. In the false or spurious organized products, we meet with formations which, on the one hand, are developed in the affected organism after the manner of its normal organs, and are associated with it; and, on the other hand, do not belong, and are foreign or even hostile to it, seeing that they destroy its organic matter like parasitic growths.

They are organized, and exhibit a structure like that of normal organisms; they possess a determinate organic configuration, which often very closely resembles the form of regular or normal agents; like the ultimate organic elements, they consist of masses which are generally of a rounded shape, and are surrounded with a proper envelope. * * * * * These points have a proper vital course, proper periods, and peculiar processes of nutrition and secretion. Like many beings low in the scale of organic life, they finish by a softening and a dissolution of the mass. Moreover, they almost all possess the faculty of self-reproduction; for, alike in the diseased and healthy organism, they can propagate (by contagion) by means of molecules, which detach themselves from the general mass, and which, being then deposited upon another point, become developed and give rise to an affection altogether similar to that from which they were derived. These molecules possess so independent a vitality that they are capable of resisting the assimilative power of the organism. It is for this reason that it is generally so difficult, and often quite impossible, to cure them; for they possess a force of reproduction much greater than that of the organism and its different parts, being not unfrequently capable of reproducing themselves, even after they have been separated into invisible rudiments. They become fixed in the system, so that it is utterly impossible to trace any line of separation. This is clearly proved both by the morbid formations (*psorosperms* and others) discovered by Müller, by the uncertainty that still prevails as to the nature of Acephalocysts, and by the circumstance that certain naturalists have declared that several false organizations were entozoary productions.

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As the entire organism is composed of primitive molecules (cellules,) and as it is a universal physiological law that certain material or organic changes attend every dynamic arrangement, we must attribute all morbid alterations in the body

to changes in the condition of these primitive formations. It has been shown that in inflammation, typhus fever, chlorosis, scrofulous disease, scurvy, and many other maladies, the globules of the blood undergo a decided change; that all sorts of external influences modify the form and colour of these globules; that in tabes dorsalis, the parts which compose the spinal marrow, and in atrophy, the molecules which compose the affected organ, are evidently more or less altered in their character; and that even in mental diseases we may often demonstrate a change in the conformation of the brain, manifested by an alteration of its primitive molecules. It is by the right application of the microscope and of chemical tests that we may hope to discover the determinate alterations in the primitive constituent elements of the organism. The production in diseases always takes place up to a certain point, independently of the idea of the individual organism; because the primitive molecules are not found in a tissue which occupies, or which has occupied the morbidly affected point. Every disease therefore, whatever be its name, must be considered as consisting in a false or abnormal organic production.

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The researches of *Langenbeck* on the contagious nature of carcinoma, and those of *Klenck* on that of tubercles, melanosis, condylomata, warts, coryza, carbuncle, hydrophobia, and the acute exanthemata, have clearly shown that primitive, morbid, and abnormal molecules may reproduce other like molecules; and, in short, that it is this very production of "molecules monstrueuses" which occurs in and constitutes the essential character of a contagious disease. The numerous examples of hereditary harelip, of supernumerary fingers and toes, and other vices of conformation, satisfactorily demonstrate that abnormal monstrous organized formations have the power of reproducing their like—a fact that quite accords with, and fully confirms, the accuracy of our position, that the morbid molecules in a living body are capable of producing molecules of a like nature to themselves.

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As to the mode of development of those vegetable and animal *protorganizations*, which we have regarded in the preceding remarks as false organizations and morbid productions, our author suggests the following propositions to show that they are formed from an altered or vitiated state of the organic molecules and primordial *cystoblastema*.

1. It has been observed by many naturalists, that in the lowest organized forms of the animal and vegetable world, there occur transformations from one nature into another. Now the primitive molecules of the organism are endowed with a proper and independent vitality in a high degree, so that they will sometimes continue to exist when transplanted into a different organism. This vitality, we may fairly presume, becomes still greater in certain favourable circumstances. Why then, seeing that we recognise a similar augmentation of the individuality of the primitive molecules, may not external influences advance a step further, and so act that the primitive molecules or their *cystoblastema* become transformed into beings that are completely individualized, into veritable protozoites et protophytes that are susceptible of a parasitic existence, as in the abovementioned transformations of the lowest forms of organized nature? There is produced in beings of a less perfect development the germ of other beings that are more perfect and complete. Now it is probable that a transmutation of the elementary molecules of the organism into beings possessing an individuality of existence may take place, as we have supposed. Various observations on certain animal and vegetable existences render this supposition highly probable.

2. The processes of fermentation and putrefaction are, according to the opinion of *Liebig*, movements of decomposition, in the former case of unazotized, and in the latter of azotized substances. Both belong to what have been called chemical metamorphoses; *i. e.*, to that class of phenomena in which an organic

combination is decomposed by the chemical affinity of a second body, or by the influence of heat, or by some other cause, so that there are evolved from them two or more new compounds, and yet none of these elements is rendered free.

It is now ascertained that in fermenting fluids there become developed vegetable productions of an inferior order, and in putrescent animal matter certain infusoria, which, in the opinion of some distinguished naturalists, are generated by spontaneous formation; although, when once formed, they may propagate themselves by a process of vegetation. Now it is probable that not unfrequently those morbid conditions—which consist in the supervention of similar decompositions in some part of the body, in the *cystoblastema*, or in the primitive molecules of the fermentation and putrefaction—and consequently the chemical elements of the cystoblastema or of the molecules, experience a derangement in the attraction, which is indispensable to the continuance of the organization in a healthy condition: this derangement being occasioned by certain external agencies which entirely overpower the dominion of the general vital powers. Among these derangements we may enumerate various diseases, gangrenescences, putrescences, &c. But in these conditions there may possibly be developed—in consequence of the influence of external agencies, by spontaneous generation—in other words, in consequence of the ever-acting creative power of Nature on organic matter in a state of decomposition—certain powers or properties, in the same manner as in the processes of fermentation and putrefaction. On this, as on other points, it is to the morbid states of the vegetable world that we are to look for the most conclusive instances in the way of illustration.—*Haeser's Archiv.*, and *Archives de la Medecine Belge*, *Juin*, 1844.

On the Microscopic Texture of Cancer.

M. Desormeaux has recently published a valuable inaugural dissertation, entitled *Recherches sur la theorie elementaire de la production des tissus accidentels*, in which he has given an excellent summary of all the recent researches on the intimate structure of cancerous formations.

Müller, and (since the publication of his writings) most other pathologists, has arranged these morbid growths into two great families or groups, viz., the Encephaloid and the Scirrhous. Of the former he makes the following three subdivisions.

1. Carcinoma medullare, *in which there is a predominance, in the medullary mass, of round globules over loose fibrous tissue.* The globules are of various sizes; but the smallest are larger than pus-corpuscles. Each contains a granular substance or nucleus within. They are very similar, in many respects, to those of common Cancer, and of reticulated Carcinoma or Scirrhus.

2. Carcinoma medullare, *consisting of pale, elliptic, non-elongated Corpuscles, and of a fundamental cerebriform mass.* These corpuscles are usually twice or three times as large as the globules of the blood. There is never any appearance of fibres proceeding from their surface, and they rarely exhibit any traces of nuclei within them.

3. Carcinoma medullare *with fibrated or fusiform corpuscles.* This species of Encephaloid structure has at times, on laceration, a sort of fibrous aspect, when the fusiform corpuscles are arranged in a somewhat determinate direction. According to the direction which they assume, the morbid mass will present a radiated or a tufted appearance. In many cases, indeed, their directions are so various that the lacerated surface exhibits no trace of fibres anywhere. The fusiform corpuscles are sometimes nucleated; at other times they contain granular points, but without distinct nuclei. They are elongated on one or two sides into fibres of different lengths. They may be considered as cells that are arrested

at the period of the process of transition from the cellular to the fibrous condition.

The three forms of the disease now described may (most probably) be regarded as so many degrees or stages in the development of the same tissue; these successive stages being characterised, 1, by rounded nucleated globules; 2, by elongated oviform globules, which are either non-nucleated, or indistinctly so; and, 3, by fusiform globules.

These several kinds of globules may be regarded as so many successive epochs of evolution, through which a *cell* must pass before it can become a fibre. Thus we find that, in an Encephaloid mass, there is the same transformation of the primitive elements as occurs in many normal tissues—with this difference only, that the process of evolution is not complete, being arrested before the fibrine is perfectly formed. There is a perfect analogy in their mode of formation. The essential element of an encephaloid tumour is the presence of cells. In some cases the entire mass is composed of them, placed one alongside of the other, but without having any perceptible bond of union; while in others, there is a network of fibrous or cellular tissue interposed between the cells. When this fibrous tissue prevails, the Encephaloid then approaches in characters to the Scirrhous structure. In the latter, the existence of the two elements—cells and fibres—is always more distinctly marked than in the former. The fibres are often quite perceptible by the naked eye. Sometimes they are lengthened and run parallel to each other: at other times, they form rounded capsules, within which the globules are contained. As in the case of the newly-formed fibres of the cellular tissue, so those of a scirrhous formation are destroyed by acetic acid, leaving nuclei or nucleated fibres behind. The fibres sometimes exhibit at different points a sort of varicose enlargement, within each of which a nucleus is found. This appearance is often observed in fibrous tumours (not genuine scirrhus) of the uterus and other parts.

In the *reticular Carcinoma* of Müller, the white network, which encloses the scirrhous globules in its meshes, is formed of round opaque granulations, three or four times as large as the blood-globules; they are occasionally agglomerated into rounded masses. The genuine Scirrhous tissue, of a pale greyish colour, is composed of globules that, on the whole, resemble those of the first stage of an Encephaloid formation. These globules are either round or somewhat oval: along with them we find free *nuclei* with their *nucleoli*.—(Vogel.)

* * * * *

From a variety of observations we may reasonably conclude that the cells of Scirrhus are formed around the nuclei of which M. Vogel speaks; their contents are at first granular and almost opaque. When the process of softening commences, the granulations disappear, the globules become transparent, and within them are formed new cells, which at first are few in number, and gradually multiply, until they entirely fill the parent cell. M. Valentin, who, in part at least, admits this account of the progress of the cells, says, that the parent cells eventually burst and discharge their cellules: in this way we may account for the presence of young free cells in scirrhous formations that have become softened.

The intercellular substance seems to undergo certain modifications corresponding with the evolution of the cells; the granulations or granular points, which it often contains, usually disappear, and it becomes limpid, while at the same time the space, which it occupies, is diminished by the enlargement and multiplication of the cells.

The fibrous network does not appear to follow in its alterations the development of the cells: it may remain firm and resisting, while the cells are far advanced in their evolution. Even when a scirrhous tumour has become completely softened, this tissue sometimes forms shreds that retain their original character.

In *alveolar Cancer*, the basis of the morbid tissue consists of white fibres and lamellæ, which cross and intercross with each other, intercepting between the meshes thereby formed limpid cells, either closed or communicating with each other, of various sizes from that of a grain of sand to that of a large pea, and filled with a transparent gelatinous substance. In this substance there are cells, and these cells contain other cells more minute. The smallest of these cells exhibit at one point of their parietes a distinct dark-yellowish nucleus, and sometimes also many free and unattached granules floating within them. To this species M. Müller refers the *gelatiniform* and *areolar cancers* of Laennec and Cruveilhier. The cells of this species of the disease appear to be only an advanced or more mature degree of the cells of Scirrhus.—*Journal de Chirurgie de M. Malgaigne, Octobre*, 1844.

Professor Berrutti on the Spontaneous Generation and Nature of the Spermatic Animalcules.

The reproduction of certain animal and vegetable species is effected, without the intervention of any ovum, after the manner of what is called gemmiparous and fissiparous generation. Now there is a great analogy between the development of *gemmæ* and that of *ova*. In the former, however, all the elements, that are necessary to the production of a living being, are found contained; whereas, the latter have need of the new elements of the prolific fluid before they can become duly evolved.

Every particle of a living being—which, on being detached from its parent body, is capable of reproducing an independent living creature—does not materially differ from a bud, either in its mode of origin, or in its property of producing new individuals. Thus organic molecules, in certain circumstances, have the power of attracting to themselves new materials from surrounding bodies, which they then incorporate with themselves, and so elaborate as to form a new being. Spontaneous generation, in the opinion of Professor Berrutti, consists in the exercise of this property, and differs from oviparous, gemmiparous, and fissiparous generation, in that it takes place among molecules which, in consequence of the death of the parent, have ceased to constitute a part of a living individual.

Microscopic observations have clearly shewn that the globules, resulting from the dissolution of organic matter, possess an inherent activity: sometimes they approach to and unite with each other, and at other times they seem to be mutually repellent. It is not at all inconsistent with rational belief to suppose that this is the cause of spontaneous generation—an act, it may be observed, to which the concurrence of the atmospheric air and of water is probably always necessary.

The reproduction of parts of an organic body that have been excised or destroyed is effected by means of globules floating in a fluid which subsequently evaporates, leaving the globules dry: hence the cellular production and origin of new tissues. The same process of assimilation is likewise that by means of which the fœtus is formed in the maternal ovum, as Wolf and Rolando have shewn.

The necessary condition, therefore, of every sort of generation, reproduction, and even of the nutrition of organised parts is invariably the presence of certain organic globules endowed with a plastic activity, and floating in a fluid exposed to the contact of the atmospheric air—which, in place of furnishing carbonic acid as it does to plants, supplies ammonia for the spontaneous generation of animals. The fluid in its turn supplies hydrogen and oxygen.

The organic productions of spontaneous generation are the most simple of all,

because they spring from organic globules that are not expressly prepared for this purpose.

Professor Berrutti is of opinion that not only infusory, but also entozoary, animalcules are developed by spontaneous generation. He considers it too as highly probable that the *acarus scabiei* is the product, rather than the cause, of the itch. Lastly, he seeks to show that the Zoosperms are not genuine animalcules, but rather organic molecules formed in the minute extremities of the spermatic tubes by the effect of an exuberant nutrition. The action of the Zoosperms seems to be very analogous to that of the Pollen in the fecundation of plants; and their movements may fairly be compared to those of this vegetable matter.—*Annali Univ. di Medicina, Iuglio,* 1844, and *Revue Medicale, Nov.* 1844.

Cervical Fistulæ, a Remnant of Embryotic Organisation.

Dr. Munemayer of Verden has collected together the histories of fifteen cases of this congenital malady. The following are the conclusions which he has drawn from his researches on the subject.

1. Fistulæ of the neck always occur in the same locality; viz., in the anterior lateral part of the neck. Their orifice corresponds to the angle formed by the internal bundle of the sterno-mastoid muscle and the sternal end of the clavicle. It is rare that they are ever observed more within the edge of this muscle, or at all behind it.

2. Their orifice is always very small, and in some cases it is scarcely visible. The surrounding skin is usually more or less affected: sometimes it is red and projecting, while in other cases it exhibits longitudinal folds which become more prominent during the acts of respiration and deglutition.

3. The discharge is secreted by an internal membrane, the nature of which seems to be intermediate between serous and mucous tissues.

4. The opening of these fistulæ is always directed towards the œsophagus and pharynx. In some cases they make themselves a passage through these canals; while, in others, they terminate in a cul-de-sac: hence the division into such as are complete, and such as are incomplete. Their *trajet* is manifested externally by a sort of hardish cord that is readily perceptible by the finger, and is similar to the excretory ducts of the conglomerate glands of Wharton, Steno, &c. Those fistulæ, that are incomplete, are usually from half a line to two lines in depth.

5. Dr. Munemayer coincides in the opinion of Dr. Aycherson, that these cervical fistulæ are to be regarded as a remnant or vestige of the fœtal organisation; the parts which represent the brachiæ in the embryo, being not completely closed. It is not always quite safe to close them up, especially when they are complete. —*Med. Wochenschrift, Juin,* 1844, and *Revue Medicale, Dec.* 1844.

M. Flourens on the Development of Bone.

The following three propositions embody the chief results of M. Flourens' recent investigations upon this most interesting subject of enquiry.

1. *Bone is formed by the periosteum.* 2. *It grows by the superposition of external layers.* 3. *The medullary canal is enlarged by the absorption of the internal layers of the bone.*

The experiments, on which the first of these propositions is based, were performed on dogs. A portion of one of the ribs was excised; removing only the

bone, and leaving the periosteum behind. It was found that, after the expiry of a few days, a minute osseous nucleus was formed within the periosteum between the two divided ends of the rib. This nucleus became larger and larger, until at length it rejoined these ends, the one to the other, thus filling up the void space between them.

The numerous preparations, exhibited by M. Flourens at the Royal Academy, clearly show that the new bone is formed in the periosteum; that, when it is first formed, it is completely insulated and apart from the old bone; and that it is only by its gradual development and extension that it ultimately reaches the two divided ends of the old bone, thus re-uniting them together.

The *second* proposition—*bone grows in size by the super-position of external layers*—was established by numerous experiments on dogs and rabbits. One of the tibiæ was exposed, the periosteum divided, and a ring of platinum wire was then passed around between the bone and its investing membrane. The wound being then closed and left undisturbed, it was found after a certain period that the new bone, that had been formed, fairly invested with its recently-deposited layers the platinum wire. The *third* proposition was equally satisfactorily made out by the preparations that were exhibited.—*Comptes Rendus—Encyclographie des Sciences Medicales, Oct.* 1844.

On the Deposition of Carbonaceous Matter in the Tissue of the Lungs.

1. There is continually forming and accumulating in the lungs of man, during adult life, and more especially in old age, a certain amount of carbon in a state of the most minute subdivision.

2. This carbon, that exists even in the very substance of the pulmonary tissues, does not come from without.

3. Wherever it exists in sufficient quantity to form deposits of one millimetre in extent, the air-tubes, the blood-vessels, and the pulmonary tissues become transformed into a dark-coloured substance, which may occupy even more than one half of the entire lungs.

4. The respiration no longer goes on in those parts which serve as a *matrix* to the carbonaceous deposit; there also, the phenomena of the circulation do not take place in the state of disease, and the process of inflammation is consequently never developed.

5. The successive accumulation of this carbon beyond a certain term is apt to cause death in old age, by rendering the pulmonary tissue more or less impermeable to the air.

6. The constant presence of this substance in the lungs of old persons is one cause of the fatality of pneumonia and congestive affections of the respiratory organs in them.

7. These molecules of carbon in the pulmonary parenchyma seem to have a marked influence on the phenomena, which may subsequently occur in and around tuberculous deposits. When tubercles are formed in the lungs, and the carbonaceous matter is deposited in considerable quantity around them, they do not undergo the successive changes proper to phthisis, in the usual course of this disease. The tubercles become calcareous, are deprived of their fatty matter, and do not enlarge. No vessels of new formation are developed around them; or rather, if such vessels have already become enlarged before the deposition of the molecular carbon, they become obliterated in consequence of this deposit, and the progress of the phthisical disease is arrested.

8. The production of carbonaceous matter in the lungs of man,—occurring, as it does, quite independently of any trade or profession and (most probably) of

any particular sort of food—is a fact which should be studied in a pathological as well as a physiological point of view, considering the influence which it may have on the course and issue of the most frequent pulmonic diseases to which old persons are liable. It would seem also that the deposition of this matter in the parenchyma of the lungs has a tendency to arrest the progress of phthisis, by forming a wall around the tubercles, and thus separating them from the intact pulmonary tissue.—*Comptes Rendus.—Revue Med. Dec.* 1844.

ON THE TRANSPLANTATION OF THE CORNEA IN MAN.

M. Reisinger, in 1824, was the first who proposed to treat incurable central leucoma by substituting the clear cornea of a living animal for the (previously removed) cornea that was rendered opaque by disease. If we may quite credit his statement, he succeeded perfectly on one occasion (in a brute) by this method. Dieffenbach repeated the experiment several times; but in no case with success. Subsequently it has been tried by a good many different gentlemen, and with very various results. On some occasions the transplanted cornea has speedily mortified and fallen off, while in others it has more or less completely united, but shortly afterwards lost its transparency. In a few instances (it has been asserted) not only has this union taken place, but the transplanted cornea has remained perfectly clear.

M. Feldmann, in his recent critical examination of this question, is strongly inclined to doubt whether the operation has ever fairly succeeded; for, in all his experiments the transplanted cornea has uniformly become not only opaque, but more or less irregular on its surface. It has only been within the last few years that an attempt has been made on the human subject to cure staphyloma in this way. Professor Wutzer of Bonn, and Dr. Kissam of New York, seem to have performed the operation about the same time, and without either gentleman being aware of what the other was doing. The former made use of the cornea of a living sheep to replace the diseased cornea that was excised. The transplantation, we are told, succeeded; but the cornea subsequently became quite opaque in consequence of the ophthalmia that ensued. The Professor repeated the operation on another patient, but with no better ultimate success.

The account of Dr. Kissam's case will be found in the New York Journal of Medicine for March, 1844. He made use of the cornea of a pig's eye, securing it in its new position with two ligatures placed in the direction of the palpebral commissures. For thirty-six hours after the operation, there was great chemosis of the eye-ball, so that it was difficult to ascertain the state of the parts. It was then found that the new cornea was adhering; the ligatures were therefore removed. The vision was improved immediately after the operation; but, as the humours of the eye were themselves unhealthy, it was very imperfect. The replaced cornea retained its transparency for a fortnight; then it became opaque, and ultimately it was absorbed.—*Journal de Chirurgie, Sept.* 1844.

N.B. There is an elaborate historical account of this operation in the *Archives Generales de Medecine* for May last.

HYDROCELE OF THE NECK.

The tumours of the neck, which M. Maunoir has designated *Hydroceles*, and M. Percy *Hydrobronchoceles*, have often been confounded with genuine Goitre; and

yet the two morbid states are very different, and they require very different modes of treatment.

As long as the tissue of the Thyroid gland is not decidedly altered, but is merely hypertrophied, we may reasonably expect to disperse the swelling by judicious treatment perseveringly employed. Not so, when any actual disorganisation has taken place.

The diagnosis is usually sufficiently easy. The experienced practitioner will not confound the hard, irregular, and lobulated masses, which are the result of the degeneration of the thyroid gland, with the smooth and uniform rounded tumours, unaccompanied with any change in the colour of the skin, and in which a fluctuation is more or less distinctly perceptible.

Sometimes, indeed, the gland, situated immediately in front of the neck, is *parsemée* with cysts which gradually dilate until they acquire an immense size; but even then it will be generally not difficult to distinguish their origin and real nature, and to discover in their circumference some parts of the organ in which they have become developed.

One cyst may attain such dimensions that it compresses the surrounding parts so much as even to cause their atrophy—a condition which probably existed in the second case which we propose to relate.

The parietes of the cyst present, in the majority of cases, so considerable a density or firmness that we are obliged to renounce the treatment by injecting a stimulating fluid into its sac; for this would only induce inflammation of the tumour, without being followed by any adhesion of the opposite surfaces, or obliteration of the cavity.

M. Maunoir was the first to recommend the use of the Seton; and most surgeons have followed his practice. In the following two cases, however, the knife was used instead; the success obtained fully justified the propriety of this mode of treatment.

Case 1.—A lady, 30 years of age, had for a length of time been distressed with sharp pain in the cervical region; her sleep was much disturbed, and her general health a good deal affected. Ever since the catamenia first appeared, there had been a fullness in the situation of the Thyroid gland. For many years it produced no inconvenience; but of late the patient was much incommoded by it. M. Fleury, when he first visited her, learned that, for some days previously, her breathing had become so much embarrassed that her attendants were afraid of suffocation. At this time the tumour of the neck was as large as the head of a full-grown child; it was quite smooth and uniform on the surface; the teguments were unaltered, except immediately in front, where they were attenuated and of a purplish hue, indicating incipient ulceration, and did not adhere to the subjacent mass, which appeared to be closely attached to the parts on which it rested. An indistinct feeling of fluctuation was perceptible on moving the tumour to and fro. On making an exploratory puncture, a few drops of a brownish-coloured serosity flowed out; the opening was enlarged with the bistoury, and a large quantity of this sort of fluid, holding in suspension a number of dark coagula, escaped. The patient experienced great relief from the removal of the pressure on the trachea and œsophagus.

Some time afterwards the following operation was performed, with the view of effecting a radical cure of the malady. Two semi-elliptic incisions were made so as to embrace the attenuated portion of the skin on the front of the neck; the integuments were then dissected back from the tumour on either side, and as much of the parietes of the cyst was excised as possible, with curved scissors; but its posterior wall adhered so firmly to the trachea that it could not be separated with safety. A very great number of blood-vessels required a ligature; many of them had become enlarged to a very considerable size. The wound

was then filled with lint, and a roller was passed lightly round the neck. In the course of a few days, a healthy suppuration was established, and the internal surface of the wound began to be covered with granulations. A month after the date of the operation, the patient was able to leave her bed-room, and was quite free from the horrible pains from which she formerly suffered; all the inconvenience that remained was an unpleasant stiffness in moving the neck.

Case 2.—A young woman, 23 years of age, had for 10 or 12 years before she consulted M. *Fleury*, been affected with sharp pains on the left side of the neck, which was considerably enlarged. Immediately in front of the trachea there was a tumour as large as a full-sized orange, and which, independently of the deformity thereby occasioned, distressed the breathing at intervals; and sometimes so much as to oblige her to remain in the upright position during the whole of the night: it appeared to adhere firmly to the air tube. As I thought that I could feel a fluctuation, I proposed to practise an exploratory puncture. A long narrow bistoury was therefore introduced; and from the wound there issued a small quantity of a creamy-looking whitish fluid.

As little or no relief was obtained from this operation, I determined to adopt a similar line of procedure as in the former instance.

A vertical incision having been made along the entire length of the tumour, the cyst was freely opened, and gave vent to about a glassful of the same sort of fluid as had flowed out before. On introducing the finger, I felt a large sac, whose cavity extended upwards above the larynx and downwards to the sternum; its walls were very hard and resisting, and its inner surface was lined with a fibro-cartilaginous covering. This large pouch was filled with lint, after several small arteries were secured by ligature, and a gentle compression kept up by a roller passed round the neck.

A copious and rather fœtid suppuration ensued, and continued for several days; but the character of the discharge gradually improved, and the state of the patient was altogether more satisfactory. Repeated injections of chloruretted water were found to be of great use. At the end of the fifth week, it was not necessary any more to introduce lint into the cavity; and all that was required was merely to leave a small portion of it in the orifice, in order to maintain this sufficiently open. Two weeks subsequently, the suppuration ceased entirely, and the wound healed.

M. *Fleury* considers these two cases as sufficient to show that surgeons should not follow M. Maunoir in unreservedly condemning the treatment of Hydrocele of the neck either by simply incising the cyst and discharging its contents, or else by removing a certain portion of its parietes at the same time. It will be generally prudent to excise a small portion of the sac immediately in front; otherwise the wound will be apt to contract so much as to interrupt the free evacuation of the discharge.—*Annales de la Chirurgie.*

M. Bouchacourt has recently published two cases of encysted Goitre, or Hydrocele of the neck, of which he effected the cure first by puncturing and then (immediately afterwards) injecting a solution of Iodine—one part of the tincture to two, three, or four parts of water. In both cases, suppurative inflammation ensued, and the swelling required to be subsequently opened, in one instance with the knife, and in the other with caustic. In the latter case, the progress was slow, and for a length of time anything but satisfactory. Several months elapsed before the cure was complete. On the whole, we (Rev.) cannot regard the recorded experience of M. Bouchacourt as very encouraging as to the effects of the treatment which he recommends. He acknowledges that he was indebted to M. Velpeau for the suggestion of using the Iodine injection in such cases.—*Bulletin General de Therapeutique*, Sept. 1844.

Great Malformation of the Heart; a single Auricle and Ventricle.

During the first six weeks of life, the child, (the subject of the present case) seemed to thrive perfectly well; but then the breathing became difficult, and the surface of the face and body to exhibit a blueish hue. At six months, she was seized with convulsions, which were followed by hemiplegia of the right side. This, however, gradually became less and less, and eventually the young sufferer recovered so well, that she could walk about with ease, after the right *tendo Achillis* (which had become contracted) was divided by M. Scoutteten. The dyspnœa and cyanosis were always increased upon any exertion; the blue tint was more *prononcé* on the right side. In her sixth year the girl died of an attack of Bronchitis. *Dissection.*—The substance of the two ventricles of the heart was nearly of the same thickness throughout. The septum was almost entirely awanting, there being no trace of it except at the lower part. The orifice of the pulmonary artery was separated from that of the aorta only by a small spur, which formed the upper part of the circumference of the interventricular opening. There was only one auriculo-ventricular orifice, common to the two ventricles and two auricles. These last-named cavities were separated from each other by a thin septum, which did not reach as far as this orifice, and therefore was incomplete. The *foramen Botalii* also was so open as to admit the point of the little finger. Thus it was that a free communication existed not only between the cavity of the ventricles and that of the auricles, but also from one auricle to the other. The auriculo-ventricular orifice was provided with a large triangular valve, that was attached to the anterior three-fourths of its circumference, and fixed at its apex to *columnæ carneæ* on the posterior part of the ventricular parietes. A few *columnæ*, proceeding from both ventricles, were attached to the two lateral borders of the valve.

In this case, therefore, although there were distinct vestiges of four cardiac cavities, we may fairly say that the heart was simple—*i. e.*, consisting of one ventricle and one auricle—as it exists in Batrachian animals. The presence of a single auriculo-ventricular orifice can leave no doubt on this point.—*Gazette Medicale*, No. 7, 1845.

French Opinions on the Treatment of Typhus.

"In the treatment of our fevers, we have daily occasion to witness the pernicious effects of an irrational practice. There are still many physicians amongst us who almost invariably have recourse to the use of blood-letting and other debilitant remedies. The effect of such a course is inevitably to render the convalescence exceedingly tedious and often very imperfect. Many simple cases are thus converted into troublesome and unmanageable ones, in consequence of the impaired energy of the vital forces that has been induced. When the occurrence of the symptoms of adynamic weakness forces such practitioners to discontinue the use of their lowering regimen, they generally resort to the use of blisters and the administration of tonic medicines.

Let us briefly review some of the features of the disease.

There is usually a more or less considerable derangement of the stomach and bowels at first. Fortunately we have a remedy, or rather a class of remedies, which is exactly suited for the relief of such symptoms—we allude to emeto-cathartics: they generally act almost magically in removing the symptoms of the first stage of such fevers. After due evacuations both upwards and downwards, not only does the pyrexia usually subside, but all the phenomena of congestion and local irritation, that may have been present, are more or less com-

pletely relieved. The same decided and prompt benefit cannot indeed be expected from the use of these remedies, if the fever has already existed two or three days before they have been exhibited, and if any delirium be present: but even then the relief is sometimes very notable; the headache, stupor, and general prostration not unfrequently ceasing, or, at all events, being very materially diminished, after the action of the vomiting has entirely ceased."—*Gazette Medicale, Aout*, 1844.

We cordially assent to the practical truth and importance of these therapeutic instructions respecting the use of Emetics and Purgatives in the first stage of most typhoid fevers. We have often expressed our own opinions on this subject in the pages of this Journal, and strenuously urged our readers to recur to the practice recommended by the older physicians, and most religiously to eschew the evil ways of such advisers as the disciples of the Broussain school. Still, we are not inclined to go quite so far as our French brother, when he goes on to advise the administration (however guarded) of emeto-cathartic medicines in almost all stages of the fever of which he is treating. The paragraph, to which we object, runs thus:—"At a more advanced period of the disease, when the patients have fallen into an adynamic state, we must be more reserved in the exhibition of these remedies; not that they are not absolutely required or allowable; but only because the state of extreme debility usually present demands that the patient's strength be somewhat revived before they be given. Such cases require the use of stimulants—such as blisters, sinapisms to the abdomen and extremities—before we have recourse to the *heroic remedy*. However, as soon as the patient's strength is recovered, we should not delay longer, but resort at once to the exhibition of an emeto-cathartic: it is the sure means of preventing a fatal tendency." This seems to us dangerous advice. It is very rarely judicious to administer emetics in the advanced stage of febrile affections, when there is considerable prostration of strength; unless, indeed, the symptoms of gastric derangement are very obvious, and Nature herself makes an effort to get rid of the peccant secretions of the stomach and duodenum by the way of vomiting. The present is one out of many instances that might be adduced to show how liable the French practitioners are to carry everything to extremes. A few years ago, the mere mention of an emetic in Typhus fever—which at that time was of necessity a *gastro-enterite*—would have been denounced by nine-tenths of the physicians in Paris as incendiary and most dangerous practice. Now-a-days there seems to be a tendency to run to the other end of the race course; and we should not be at all surprised to hear of ipecacuanha and tartar-emetic taking the heroic seat which has been so long occupied by leeches and "boissons adoucissantes."—*Rev*.

Professor Cornealini on the Proximate Cause and Treatment of Chlorosis.

From an extensive experience in the wards of the Pavia Hospital—to which he is attached as the professor of clinical medicine—the author deduces the following conclusions respecting this not unfrequent disease:—

1. The essential nature of chlorosis consists of two pathological conditions, both of them appertaining to the solids;—the *first* being an inordinate excitation of the heart and arteries, and the *second* a chemico-vital alteration of the assimilative functions of Chylification and Hematosis. It is not possible to determine which of these two conditions is the primary and causal one.

2. No plan of treatment is so certain and efficacious as the exhibition of steel

in some form or another: the preparations of this metal acting curatively upon both of the pathological states now mentioned.

3. There is no very marked difference in the comparative efficacy of different chalybeate preparations, except in so far as relates to their solubility in the animal fluids, and perhaps also to their readiness to become disaggregated by the process of digestion.

4. The addition of an acid decidedly increases the efficacy of steel remedies.

5. Steel-filings become converted, in the stomach of chlorotic patients, into the lactate of iron.

6. It is useless—and not unfrequently it is unsafe—to administer very large doses of ferruginous preparations.

Professor Corneliani has examined with great care the state of the blood in chlorosis; and most of his observations go to confirm the accuracy of MM. Andral and Gavarret's statements respecting the diminution of the normal proportion of red globules and hematosine.—*Annali Universali.*

The Actual Cautery successfully Employed in Gangrene of the Mouth.

The case occurred in a female child, five years of age, during the convalescence from an attack of Typhus fever. The peculiar (by some deemed pathognomonic) offensive odour, that accompanies this species of gangrene, was remarked before any actual appearance of the disease was discoverable. There were four gangrenous patches on the upper and lower gums, besides one on the inner surface of the right cheek. Dr. Weber determined to apply the actual cautery to all the diseased spots, and the immediately adjacent parts. This was done, not without difficulty, as may be imagined; and the mouth was directed to be afterwards washed out every two hours with a decoction of Cinchona, to which some *spiritus cochleareæ* was added. The offensive smell ceased immediately after the application of the cautery, and did not again return.

On the third day, the sloughy parts began to detach themselves; at the same time, a few suspicious-looking spots were touched with the nitrate of silver. Several teeth remained "*dechaussées*," and at three points the maxillary (upper) bone was exposed. These necrosed portions, inclosing a molar tooth, and two smaller bits of the lower jaw were subsequently detached. During the progress of the case, an offensive purulent discharge took place from the ears, and numerous small abscesses formed on different parts of the body.

Dr. Weber does not think that, in this case (nor indeed generally), there was any reason to suspect that the gangrenous ulceration of the mouth was in any degree attributable to the action of mercury upon the system. He points out the analogy between this disease—which he designates by the name of *noma* or corroding ulcer—and the *pustule maligne*, so accurately described by Boyer and other continental writers.—*Gazette Medicale de Strasbourg*, Sept. 1844.

M. Cazenave on the Different Sorts of Caustics.

The *Powder of Dupuytren* is composed of one part of arsenious acid and 200 parts of Calomel. It is a mild and very manageable caustic, that is useful in cases of Lupus in women and children, when the ulceration is superficial and of limited extent. If the diseased part be dry, it may be necessary to denude it by means of a blister, and then to sprinkle the powder upon the raw surface. A certain amount of heat and painful swelling is usually caused by this applica-

tion. When it falls off, there is generally observed a decided modification of the diseased surface. A few applications are sufficient to effect a cure in a great many instances.

The *Vienna powder and paste* are remedies of great power in certain cases of lupous ulceration. They are composed of equal parts of powderd quicklime and potassa cum calce. In using it, we take a portion this mixture, and add a small quantity of spirits of wine to bring the powder to the consistence of a paste. A piece of adhesive plaster, with a hole in it of the size of the intended eschar, should be laid over the diseased surface, and the paste is then applied upon the exposed part. It is to be left on for ten or twenty minutes, according to the depth of the eschar that is wished, and the ability of the patient to endure the pain.

The *chloruret of zinc paste* is much used in the present day. It is made by mixing one part of this substance with one or two parts of flour, moistening the mixture with as little water as possible. The pain produced by this application usually lasts for several hours. A greyish-coloured eschar is formed; and this, in most cases, remains attached for two or three weeks before it is separated. The surface underneath is generally not ulcerated. M. Cazenave very frequently has recourse to this caustic in certain cases of lupus, to destroy the non-ulcerated tubercles.

For this purpose, he usually applies only a very thin layer of the paste, so as not to destroy the entire tubercle; and in this manner he often succeeds in effecting a complete resolution of it, without any scar being left behind.

In very many cases of long-standing and deeply-corroding lupous ulceration, he gives the preference to the Arsenical paste over the two others which we have mentioned: its action is two-fold; local as a caustic; and general by becoming absorbed, and exercising a potent alterative or modifying influence upon the economy. The following is the formula which he invariably uses:—

Take of White oxyde of arsenic, 2 parts.
Sulphate of mercury, 1 part.
Animal charcoal in powder, 2 parts.

When used, a small quantity of this powder is to be made into a thin paste by the addition of a few drops of water; this is put upon the denuded surface—which should seldom or never exceed in extent that of a franc-piece. This application usually produces not only very sharp pain, but also a severe erysipelatous swelling, which lasts for 24 or 36 hours, and is sometimes accompanied with grave constitutional symptoms. Generally these subside very quickly; and then there remains on the cauterized part a hard brown crust, which often adheres for nearly a month, before it is detached.

Fluid caustics.—M. Cazenave frequently makes use of a solution of the Sulphate of Copper for the removal of those small warts that often form upon the shoulders and back, and also of certain pediculated horny productions, which occasionally appear upon these parts. A stronger solution must be used for the latter form of cuticular excrescence.

In the treatment of Favus and Tinea, he recommends a weak solution either of this salt of Copper, or of the nitrate of Silver, or of Acetic Acid.

Of fluid caustics, one of the most potent and useful is the acid nitrate of Mercury. When used to the surface pure and undiluted, it acts as a mere caustic; but when considerably weakened, and especially when applied to a large surface, it is unquestionably absorbed, and then it acts on the system.

It usually causes a good deal of pain and inflammatory swelling. The cases most benefited by its application are those of Lupus, in which the ulceration is extensive and not deep-seated.

The erysipelatous inflammation, which this as well as other caustics—more especially the arsenical paste—are apt to produce, need not be much dreaded; nay,

the effects of the cutaneous Phlegmasia seem sometimes to be decidedly salutary in the end.—*Annales des Maladies de la Peau*, Oct. 1844.

M. Gibert has recorded in a recent No. (Oct. 1844) of the Revue Medicale, a case of severe scrofulous Lupus of the face, in which the progress of the disease was arrested and the extensive ulcerated surface became cicatrized under the employment, external as well as internal, of cod-liver oil. The use of this medicine was steadily persevered in for a full year and a half. During this time not only did the local malady become healed, but the general health—which had formerly been very weak and ailing—was very decidedly improved.

The patient was a young woman, and the disease had existed for nearly six years. On one occasion she had derived very considerable benefit from the internal administration of the deuto-ioduret of Mercury, and the external use of the proto-ioduret ointment; but the benefit was temporary only. She had been subjected to a regular and protracted course of iodine treatment; but certainly with no advantage.

CORROSIVE SUBLIMATE IN EPILEPSY.

In an elaborate article upon the Neuroses of the Ganglionic Nerves by M. Merat, Member of the Royal Academy of Medicine, we find the following remarks:—

"Since the year 1810, I have been in the habit of administering the Corrosive Sublimate in the treatment of several nervous diseases, and more especially of Epilepsy. I have witnessed decidedly successful results from its use in a good many—but certainly, it must be confessed, not in the majority—of the cases of this malady. The formula, which I use, will be found in the Dispensatory of Bouchardant (ed. 1840, p. 394.) A pill, consisting of a sixteenth part of a grain of the Sublimate, one grain of Camphor, three-fourths of a grain of Opium, and half a grain of Musk, is given daily; this dose is to be increased every eight days by an additional pill of the same ingredients. Some patients have been able to take one or even two grains of the sublimate in the course of the twenty-four hours. As a general rule, I have never wished to exceed half a grain at most; unwilling to run the risk of inducing a black colour of the skin, as has happened to some patients after a protracted use of the drug."—*Revue Medicale*, Oct. 1844.

CASE OF DRACUNCULUS OR GUINEA-WORM.

Towards the close of the year 1843, a man, who had returned from Senegal, was admitted into the St. Antoine Hospital, at Paris, for a small furuncular swelling on the dorsom of the left foot. It had existed for about a month, and was accompanied with intolerable itching in the part. An incision was made upon it, and next day, M. Maisonneuve observed that a white filament projected from the wound: this was drawn out to the extent of about nine inches, and then it broke across. Another boil formed a little way below the head of the fibula; and as there was a tortuous, somewhat indurated, and painful subcutaneous line, extending from this point towards the calf of the leg, the skin was divided in two places, and an entire worm drawn out: it was of the thickness of a crow-quill, and upwards of two feet in length; it much resembled in appearance the *vas deferens*. The purulent matter from the two abscesses was carefully examined with the microscope; and, in that from the second one, there were observed myriads of minute animalcules, that moved about with great rapidity. On examining the worm itself, a milky fluid was perceived to be contained at one part of its tubular body.

In this fluid too, numerous animalcules, similar to those which we have alluded to, were detected by the aid of the microscope. M. Maisonneuve very reasonably concludes that these embryotic Dracunculi may readily insinuate themselves under the skin in persons who are in the habit of walking about with naked feet in such countries as that of Senegal. There is therefore no occasion to have recourse to the very questionable doctrine of Spontaneous Generation to account for the development of these subcutaneous entozoa. It is probable that the worm, when developed under the integuments, remains quiet until the period for discharging its ova has arrived, and then it makes an effort to perforate the skin, and become liberated for that purpose.—*Archives Generales de Medicine*, Dec. 1844

On the Periodic Discharge of Ova, and the Function of Menstruation.

The following propositions embody the most important conclusions that have been formed by the best authorities on this highly curious subject.

1. Menstruation commences at the period of the *maturity* of the ovules.
2. The final cessation of the catamenial secretion coincides with the abolition of the formative function of the germs. 3. The ovaries of women, who have ceased to menstruate, never contain the appearance of any vesicles that have recently burst, or that are about to do so (Negrier.) 4. At each menstrual period, the highly excited state of the ovaries induces in the female a decided propension to coition. 5. The aptitude for fecundation is greatest on those days that immediately precede the menstrual discharge. 6. In all the lower animals, the ovaria become tumid during the season of rutting. 7. Women, in whom there is a congenital absence of the ovaria, never truly menstruate, however perfect may be the structure of the uterus and other parts of the generative system. 8. The extirpation of these organs puts a complete stop to menstruation, in cases where this function had been already established. 9. Women, in whom there is a congenital absence of the uterus, but in whom the ovaria are normally developed, experience every month all the phenomena of menstruation, the sanguineous discharge alone excepted. 10. The catamenial secretion ceases completely in women, in whom the ovaria have become affected with organic degeneration. 11. It has been asserted by some writers that lascivious girls have—in this respect like the common hen—occasionally discharged ova from the vagina, and that a mere voluptuous thought will suffice *pour ebranler* these minute vesicles. 12. In very many women, the menstrual period is preceded by severe colicky pains, attributable most likely to the turgid and excited state of the ovaries.

13. In those who suffer much at these periods, the cavity of the uterus sometimes becomes lined with a soft flocky membrane—a genuine *membrana caduca*—the formation of which is entirely independent of coition. 14. Lastly, in that singular case of monstrosity—in which the two girls, Helen and Judith, were united to each other by the posterior and lower parts of the back—the catamenial discharge took place in different quantities and at different times from each subject, although there was a complete anastomosis between the abdominal vessels of the two.—*Memoire pour servir à l'etude des Maladies des Ovaires, par Achille Chereau.* Paris, 1844.

M. Bischoff on the Spontaneous Periodic Expulsion of Ova.

This distinguished observer lays down the following law, which, it will be seen,

brings the generative process in the mammiferous animals under the same general rule, which obtains in that of all other classes of animals.

"Both in mammalia and man also, the self-forming ova in the ovaries of the female experience a periodical ripening, entirely independent of the influence of the male semen. At this period, which, in animals, is called heat, and in women, usually, menstruation, these matured ova separate themselves from the ovary and are pushed out. At this time, alone in animals, and especially in women, are sexual desires also manifested. If coitus takes place, the fructification of the ovum follows, in consequence of the material action of the male semen upon it. If coitus does not take place, the ovum does not the less separate from the ovary, pass into the oviduct, but there perishes. The relations of time, however, as it appears, may vary in different animals within different yet fixed limits. The semen may have sufficient time to reach the ovary before the ovum has separated. The ovum may also have already passed out, and the semen have first encountered it in the oviduct; the action of the semen upon the ovum must still, however, always take place, if the ovum is to be developed, which development is commenced while it is still in the oviduct. But at this period of the periodical ripening of the ova, alone, can coitus be followed by fecundation." Pp. 4, 5.

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"During the years in which a woman is susceptible of impregnation, an ovum ripens and is separated from the ovary, every four weeks; this phenomenon being accompanied by simultaneous hæmorrhage from the uterus. This periodical maturation of an ovum is the first and most essential condition of conception and pregnancy. At this time alone will coitus be followed by conception; at all others this last will be impossible."—P. 43.

The assertion in the last paragraph is in accordance with the opinion of M. Pouchet—whose work, entitled "Theorie positive de la Fecundation, &c., Paris, 1843," we noticed some time ago.* "As it is more than sufficiently proved that in the mammifera it is at the epoch of sexual excitation that the ovules are expelled, and that at other times fecundation is impossible, it becomes equally evident, that, as the menstrual discharge in women represents this excitation, it is only in the neighbourhood of that period that our species possess the faculty of reproduction."

It has been generally believed that women, who do not menstruate, are incapable of conception. This opinion is, in all probability, strictly speaking, quite correct; but then it is to be remembered that the act of menstruation, or the monthly maturation and expulsion of an ovarian vesicle, may take place without being necessarily accompanied with a sanguineous discharge: the ovum may be emitted from the ovary without the slightest appearance of any outward hæmorrhage.—*The American Journal of the Medical Sciences*, Jan. 1845.

Hygiene of Girls at the Period of Puberty.

"Under no circumstances should we seek to provoke the menses in girls, who are in the enjoyment of good health, even though they may have passed the mean age at which these usually appear; and for the very best reason, because all our efforts would be fruitless, as nature has not provided for their appearance. The power of ill health and sickness to retard the occurrence of puberty being satisfactorily established, we should seek to relieve any disease which may exist at the approach of that period, as the means employed for that purpose would probably act as the best emmenagogue. In one case only would it be proper

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* Vide Medico-Chirurgical Review for January, 1844, p. 223.

to seek to favour the menstrual discharge in young girls indisposed at the age of maturity; and that is, when there is every reason to believe, from the present phenomena, that the Graafian vesicles are mature, but where the congestion of the genital organs, which then takes place, cannot relieve itself by the hæmorrhage—(p. 218.) To diminish this general or local plethora, which is one of the causes of this condition, and to give a direction of the blood towards the external genital organs, general bleeding and the application of leeches to the inner part of the thighs or vulva, with warm foot-baths, enemata, cooling regimen, &c., are advisable. The same means may be pursued to a great extent, where the retardation is consequent upon extreme excitement of the utero-ovarian nervous system. In these cases, which are attended with dragging pains in the groins and loins, and by engorgement and swelling of the uterus, the author recommends, with many previous writers, the use of ergot."—*American Journal.*

ON CERTAIN DIFFERENCES IN THE COMPOSITION OF THE BLOOD IN THE MALE AND FEMALE.

MM. Becquerel and Rodier read a very elaborate memoir "on the Composition of the Blood in Health and in Disease," before the Royal Academy of Sciences, in the course of last November. As it must always be of the first importance to determine the normal condition of any of the fluids of the body, before we attempt to ascertain its morbid alterations, their remarks on the relative constitution of the blood in healthy adults of the two sexes may be deemed acceptable. The proportions given in the following table were determined by taking the average or medium figures obtained in a variety of experiments:—

	Man.	Woman.
Water	779	791,1
Globules	141,1	127,2
Albumen	69,4	70,5
Fibrine	2,2	2,2
Extractive matters and free salts . ..	6,8	7,4
Fatty matters	1,6	1,620
Seroline	0,020	0,020
Phosphorated fatty matter	0,488	0,464
Cholesterine	0,088	0,090
Soap	0,004	0,046
In 1000 parts of calcined blood.		
Chloride of sodium	3,1	3,9
Soluble salts	2,5	2,9
Phosphates	0,334	0,354
Iron..	0,565	0,541
Density of the defibrinated blood . ..	1060,2	1057,5
" of the serum	1028	1027,4

By comparing the two columns in this table, we find that certain very noticeable differences exist between the blood of the male and that of the female, in a state of health. The density of the defibrinated fluid is greater in the former, and consequently contains a larger quantity of soluble matters: the proportion of water too is decidedly less. The quantity of the red globules is considerably greater in the blood of the male than in that of the female: this is perhaps the most important, and indeed it is the fundamental, difference in the blood of the two sexes. In the female, the *minimum* number was 113, the *maximum* was 137, and the *medium* 127; (?) whereas in the case of the male, the *minimum* was 131,

the *maximum* 151, and the *medium* 141.* The proportion of the Fibrine, and also that of the Albumen, was found to be very nearly the same in both sexes. The proportion of the iron present in the blood is always commensurate with that of the red globules.

MM. Becquerel and Rodier are of opinion that the function of *menstruation* exercises a marked influence on the proportion of the red globules in the blood of the female. In the girl before this function has properly commenced, the relative quantity is below the normal standard; when the secretion is fairly established, it (the quantity) rises up to 127 or even higher; and this state of things continues until about the critical period of life, when menstruation ceases: then the proportion of the red globules falls considerably below this mark.

Pregnancy also has a very decided influence on the condition of the blood; the red globules and the albumen become diminished, and the fibrine, phosphorated fatty matter, and the water slightly increased.—*Encyclographie des Sciences Medicales*, Dec. 1844.

* This proportion is considerably higher than that (viz., 127) assumed by Andral and other hematological enquirers, as the standard of health; while the proportion of the fibrine in our table is lower than that (3) in theirs.

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